September 22, 1958

Paper Trade Journal

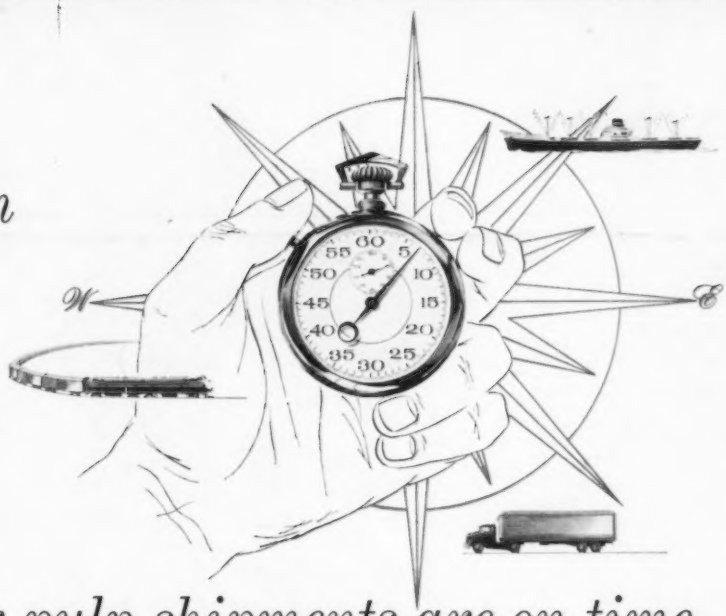
Principles of Effective Maintenance Control

Chase Bag Paper Mill Marks Centennial

New and Improved Cotton Linter Pulp

Operations Research for the Paper Industry

When Gottesman enters the picture...



...your pulp shipments are on time

Making sure your pulp shipments leave on schedule is only one facet of expert Gottesman service—but it's crucial to pulp buyers. At Gottesman, over 70 years' experience in pulp assures you of the finest attention to quality and detail, regardless of pulp grade or quantity. That's why so many of our customers have been with us so long, some over 40 years.

The Gottesman Organization

Established 1886

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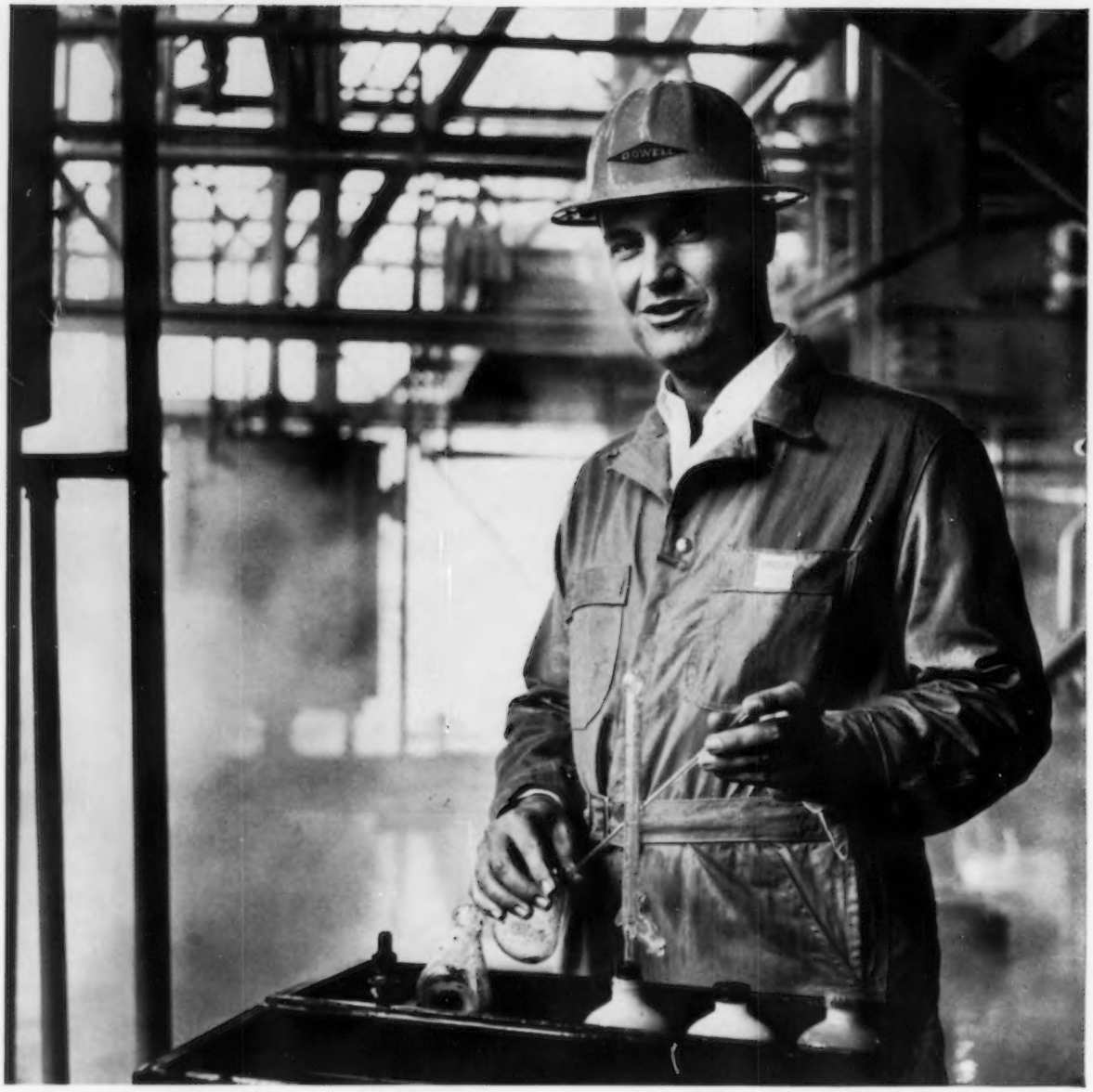

THIS MAN'S A SPECIALIST IN PROTECTING YOUR PROFITS. His title is Dowell Service Engineer. His job—to study your maintenance cleaning problems, recommend the proper solutions and apply chemical solvents to help you make more profit. He represents a team of specialists who have rendered old-fashioned all other methods of cleaning product, process and steam generating equipment. His method is Dowell Service, the modern way—using solvents—to remove scale and sludge from all kinds of metal equipment, tanks, piping and lines.

Specifically: one processor had been performing his own turnaround service—using mechanical methods—at an annual cost of $315,000. The Dowell Service Engineer and his team performed the same service in 1/10 of the time at a cost of $2300. The savings in downtime alone amounted to $210,000.

If your maintenance and operating engineers do not know the profit possibilities with Dowell Service, ask them to get the facts for you. For specific information on how chemical cleaning can help your plant to greater profits, call the Dowell office nearest you. DOWELL—A SERVICE DIVISION OF THE DOW CHEMICAL COMPANY. Headquarters and research center, Tulsa, Oklahoma, with 165 offices and stations to serve you.

chemical cleaning services for industry DOWELL

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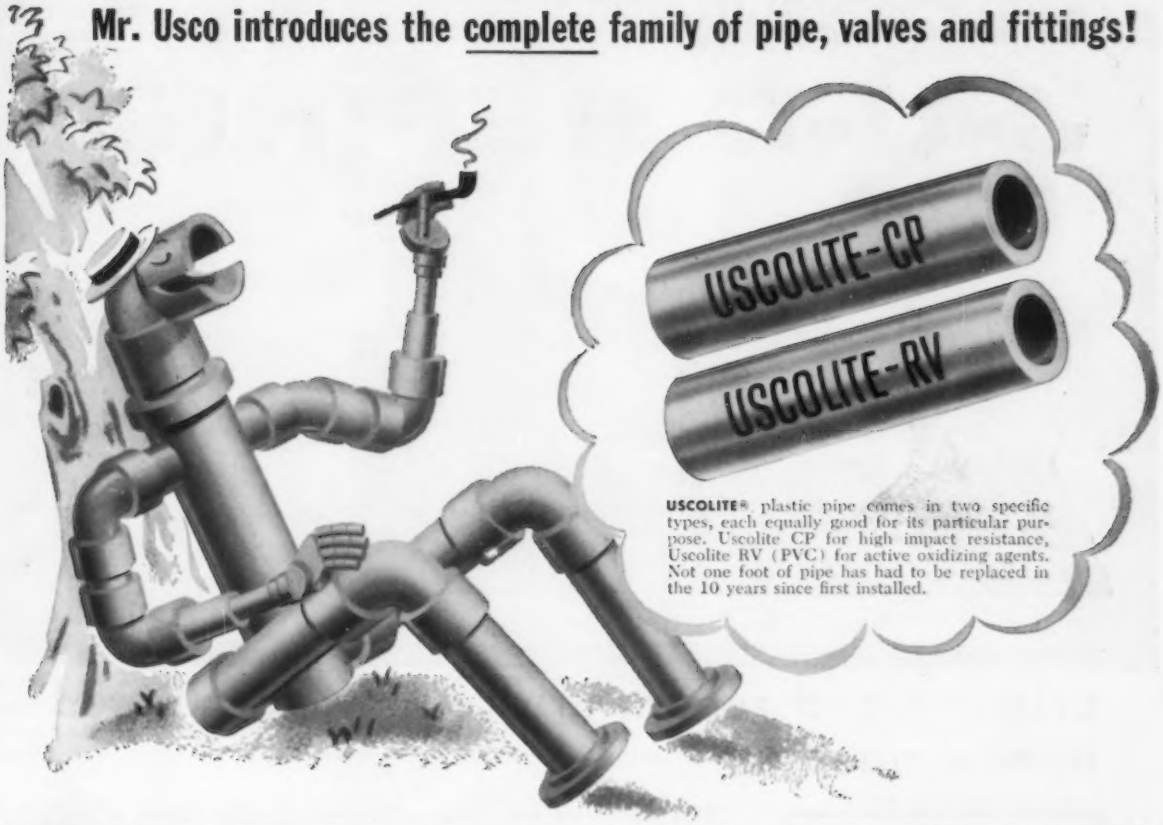
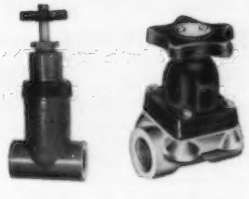
PIPE DREAMS come true!

Mr. Usco introduces the complete family of pipe, valves and fittings!



USCOLITE® plastic pipe comes in two specific types, each equally good for its particular purpose. Uscolite CP for high impact resistance, Uscolite RV (PVC) for active oxidizing agents. Not one foot of pipe has had to be replaced in the 10 years since first installed.

USCOWELD* Fittings are the only solvent-weld fittings with an interference fit. Greater joint strength, faster insertion. Non-porous, leak-proof. Made of either Uscolite CP or RV materials.



USCO® VALVES offer a choice of either Hills-McCanna diaphragm valve or Vanton "Flex-Plug" gate valve.

USCOFLOW is a new, black utility pipe, especially suited where low first costs are a factor. It is a blend of styrene-base resin and synthetic rubber for good impact resistance and high tensile strength.

The "Usco" Plastic Pipe Line of precision-molded pipe and fittings for every corrosion and flow problem includes elbows, tees, couplings, flanges, reducing bushings, plugs, caps, nipples, bends.

When you think of plastic, think of your "U.S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality plastic pipe and fittings.

Mechanical Goods Division

*Patent applied for

United States Rubber

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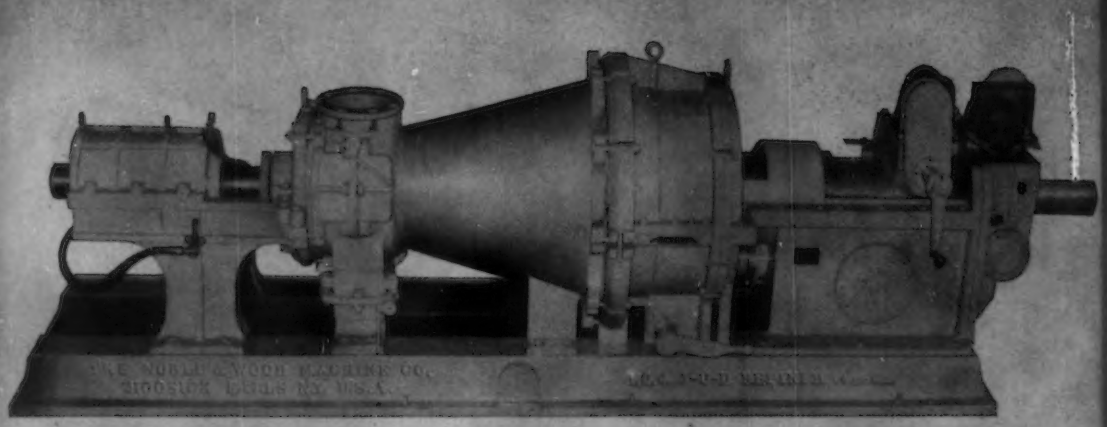
THE NEW NOBLE & WOOD J-U-D REFINER



primary and secondary refining combined in one machine:

- Two individually operating units on one drive
- Available with fully automatic or manual push button controls
- Available in a full range of sizes
- Adaptable to hot stock refining — (with no wood filling used)
- Simplified design for parts replacement and adjustment

* Let us show you how the J-U-D Refiner can improve *your* production cost figures. Write or phone today for actual production records, technical data, sizes and specifications.

This remarkable engineering achievement is miles ahead of anything else in the industry. It combines the functions of jordan AND disc refiner in *one machine that does the work of either or both.*

CUTS HP UP TO HALF

The Noble & Wood J-U-D Refiner can be used for most types and grades of paper. It provides *complete* refining of stock on a continuous basis. And it saves up to *half the usual horsepower.*

PERFORMANCE PROVEN

The Noble & Wood J-U-D Refiner has been proven in performance in leading U. S. mills.* Without exception, these mills report that this new machine is far superior to anything they have ever had. Every day that a J-U-D Refiner runs, it sets new records by combining all three basic profit factors: *increased production, higher quality, lower costs.*

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MACHINE COMPANY
Paper Mill Machinery

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Paper Trade Journal

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REMEMBER THESE DATES

Sept. 24-26: Alkaline Pulping Conference, Arlington Hotel, Hot Springs, Ark.

Oct. 7-8: Fibre Box Assn., Waldorf-Astoria Hotel, New York City.

Oct. 9-10: Fibre Drum Mfgrs. Assn., Drake Hotel, Chicago.

Oct. 9-10: TAPPI Deinking Conference, Dayton-Biltmore Hotel, Dayton, Ohio.

Oct. 20-22: TAPPI Paper-Plastics Conference, Kimball Hotel, Springfield, Mass.

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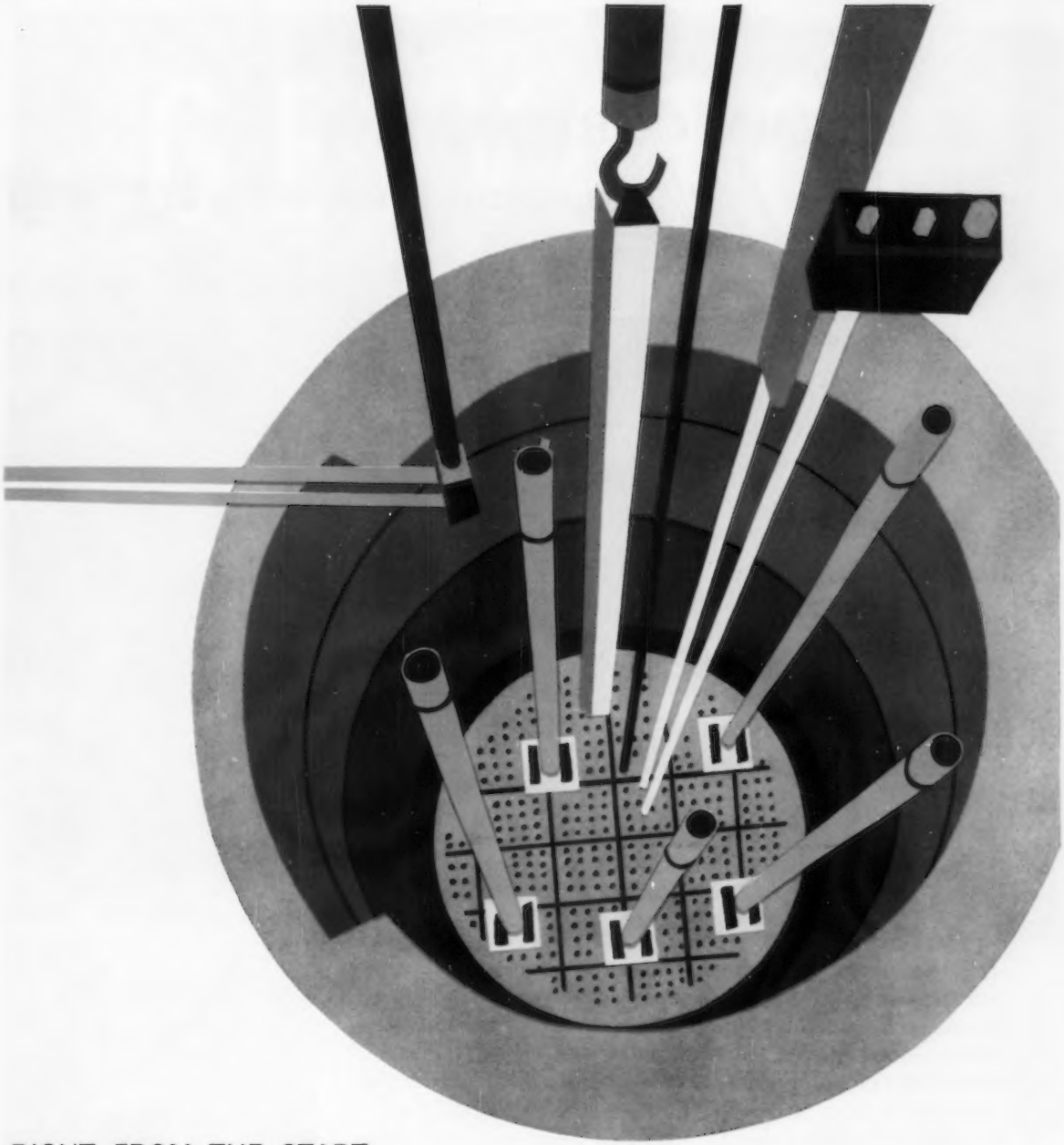


RIGHT FROM THE START . . .

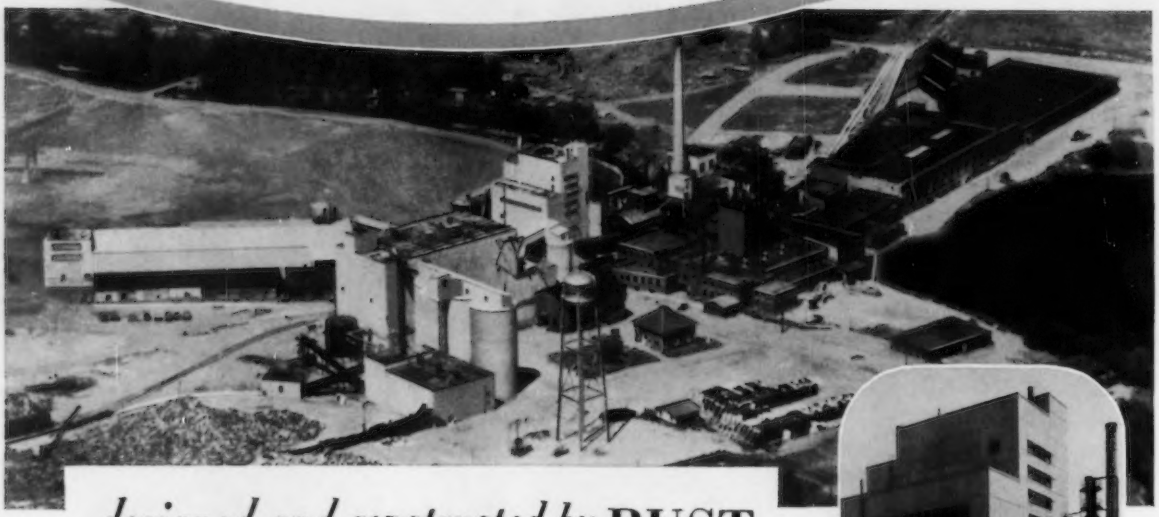
When piping costs come close to the million mark — when the installation is vast, and the leeway for error is small — a piping job must be right from the start to finish. Grinnell assures this through complete one-company control and responsibility. From interpretive engineering — through exclusive methods of prefabrication and testing of pipe and hanger units — to precision assembly and delivery, the job is all done by Grinnell, as only Grinnell can do it. The result: installations of any size, at costs known before you start, with assured performance. Grinnell Company, Inc., Providence, R.I.

Current Grinnell piping responsibilities: Enrico Fermi Atomic Power Plant, Michigan; Ohio Power Company, West Virginia; National Aniline Division of Allied Chemical & Dye Corporation, Virginia; Memphis Light, Gas and Water Division, Tennessee; Aluminum Company of America, Indiana; South Carolina Electric & Gas Company, South Carolina; Duke Power Company, North Carolina; Union Bag-Camp Paper Corp., Virginia; Pennsylvania Power & Light Company, Pennsylvania; Holyoke Water Power Company, Massachusetts

GRINNELL

EASTERN CORPORATION

New BLEACHED KRAFT PULP MILL



designed and constructed by RUST

This $11,000,000 Bleached Kraft Pulp Mill, adjacent to Eastern's existing paper mill at Lincoln, Maine, has replaced the former sulphite pulp mill. The use of bleached kraft pulps from the new mill will facilitate further diversification of Eastern's line of fine business papers.

In addition to the engineering and construction of complete pulp and paper mills, for a lump sum price, The Rust Engineering Company handles all types of assignments including such auxiliaries as bleach plants, chemical recovery plants and wood yards, water supply and waste disposal systems, and steam and electric power plants, as well as additions or renovations to existing facilities. When you are planning new projects, consider a "RUST PACKAGE CONTRACT," a single economical source for site study, design and construction. A descriptive brochure is yours for the asking without obligation.

Boiler House

Pulp Mill

New Facilities at Lincoln, Maine

- Wood Yard
- Chip Storage Silos
- Wood Room
- Barking Drum
- Chipper
- Pulp Building containing Digester, Brown Stock Washing, Screening, Bleaching and Bleach Liquor Preparation
- High-Density Pulp Storage
- Evaporator and Recovery Boiler Building
- Causticizing Lime Recovery Plant
- Turbine Generator Addition

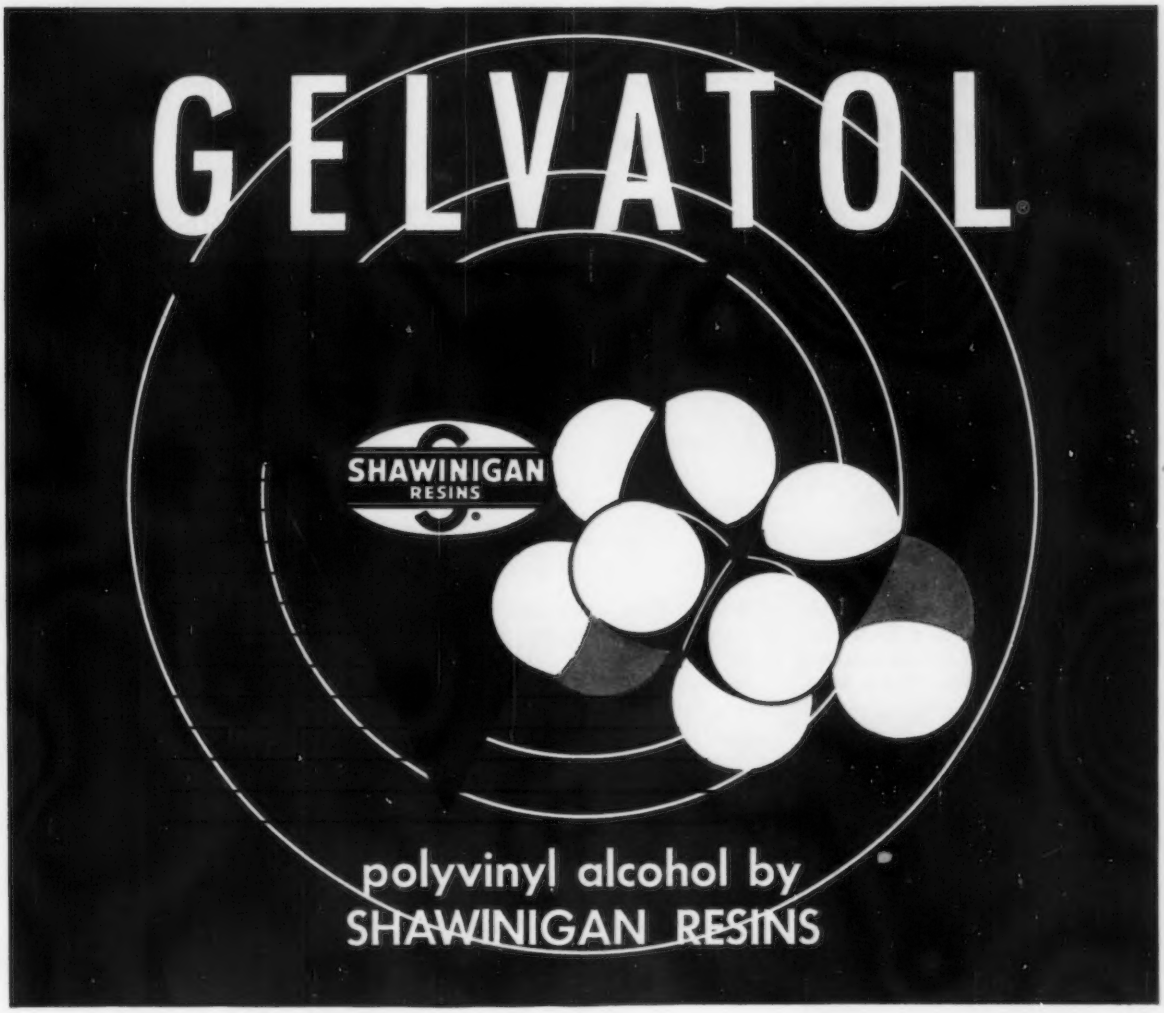
Wood Yard

THE RUST ENGINEERING COMPANY

930 Fort Duquesne Boulevard, Pittsburgh 22, Pa.

BIRMINGHAM WASHINGTON NEW YORK

P-5



requires 25-50% less storage space

The unique particle structure of GELVATOL polyvinyl alcohol, permits packaging in a smaller, easier-to-handle, 50 lb. bag. And because the bag is smaller, GELVATOL requires 25-50% less storage area, which means you can make substantial savings in your storage costs.

Twelve grades of commercially proved GELVATOL (all of which are above average in quality) are now available to you for more efficient, more profitable formulating. Standard grades for adhesives, textile sizes, paper coatings, and films, as well as the new extremely low-viscosity grades for specialty applications are ready now.

These are important advantages:

1. Unique particle structure that cuts your storage requirements.
2. Notable uniformity from bag to bag, lot to lot.
3. Particle size that minimizes dusting.
4. Rapid water solubility, and clear solutions.

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Now Penton's* Miracle Characteristics are put to use in Diaphragm Valves!

Hills-McCanna's Exclusive New Lining Meets Many of the Service Requirements That Once Called For Stainless Steel and Glass!

By: R. McFarland,
Technical Director,
Hills-McCanna Company

Here at Hills-McCanna an exhaustive search has paid off: a new lining material for diaphragm valves matches the economies of rubber lining while meeting many of the service requirements of glass lining and stainless steel.

A new Penton plastic-lined valve body (pictured below) has been developed, tested and readied for the specialized needs of the processing industries.

A six inch and three quarter inch Penton lined valve body

Because of its wide versatility, we believe a brief rundown on the new product's unusual characteristics and its ability to cope with diverse chemical service applications will be of interest to you.

Economically, the Penton plastic-lined valve stands alone. Competitively priced with rubber-lined valves, it meets every requirement placed on the hard rubber-lined types. This versatile valve has the ability to meet many of the service requirements that once called for the higher-priced stainless steel and glass-lined valves.

Performance-wise, Penton (a chlorinated polyether polymer), a product of Hercules Powder Company, affords an excellent combination of temperature resistance, chemical resistance and exceptional dimensional stability. *Penton is durable:* it takes up to 300°F without losing its ability to withstand corrosion. Also, it is absolutely non-contaminating; cannot affect a product's taste, aroma or color.

The design features of the Hills-McCanna valve body make it possible to take advantage of the excellent properties of the Penton lining. Chemically resistant Penton lining, in an armored body of cast iron or aluminum, offers the most universally adaptable processing valve available today. It handles *more* substances . . . and works equally well with metallic, plastic, glass and lined piping.

Above is a complete handwheel operated Diaphragm Valve with Penton lined body

Penton lined diaphragm valves are available in sizes ½" thru 6" with flanged ends, and diaphragm valves with solid Penton bodies are available in sizes ½" thru 2" with screwed ends.

As with all Hills-McCanna diaphragm valves, the valve is of packless construction. Its working parts are isolated from flow, and are easily accessible for simple in-line maintenance.

To introduce this valve—and to give you the opportunity of noting the properties of Penton—we have prepared a concise Technical Information Bulletin, No. 114. It contains more than 250 of the more common chemical services, temperature and pressure specifications, and elaborates on the typical services in which Penton lined valves can be used.

Supplementing the booklet is the Penton "Dollar." An immersion disc of solid Penton, it can be used to demonstrate its unusual chemical and temperature resistance characteristics. Let the Penton "Dollar" show you how you can save dollars with the use of Hills-McCanna Penton lined valves in your plant. Both Bulletin and "Dollar" are available via letterhead request. Write: *Hills-McCanna Company, 4611 W. Touhy Avenue, Chicago 46, Illinois.*

**Penton is a registered trade name of Hercules Powder Company*

Buckeye expands in Florida

to give you

brighter, cleaner, stronger pulp

■ An addition to the Buckeye Plant at Foley, Florida doubles the quantity and further improves the quality of Buckeye Pulp.

The new unit has been equipped with the finest and most modern machinery to insure brighter, cleaner and stronger pulp. Additional screening and purification equipment has also been added to our first unit, built in 1954, to make Buckeye Wood Pulp even better.

This multi-million dollar plant is only part of the Buckeye Pulp story. Take research, for example: Buckeye spends a higher percentage of sales on research than any other wood pulp producer. Take timber resources: Buckeye has four acres of timber for every ton of annual capacity, assuring a continuing supply of high grade pulpwood for increased production facilities.

In every way, Buckeye is ready to serve the expanding paper industry. Specifically, we would like to serve you. Write or phone us about your present or future needs.

BUCKEYE PULP

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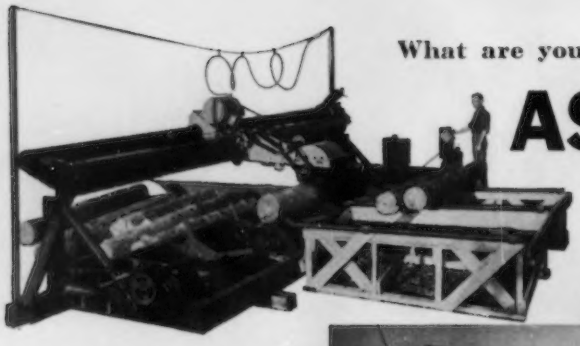
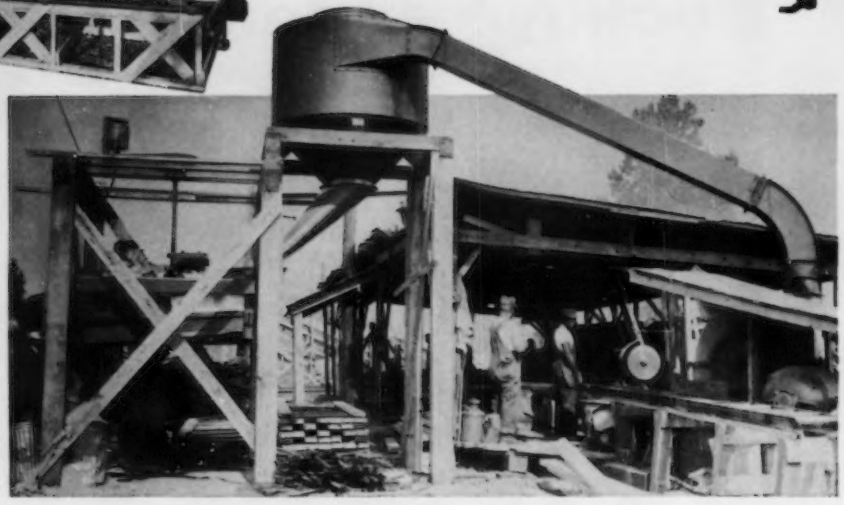
Wood Pulp Plant at Foley • Cotton Linters Plant at Memphis



What are you getting from your scrap . . .

ASH or CASH?



CHIPPING FOR A PROFIT—

Molpus Lumber Company, Philadelphia, Mississippi, cutting from 2 to 2½ MBF of lumber per hour, recently installed a woodwaste utilization setup consisting of Soderhamn DC-6 Log Barker, 48" Horizontal Chipper, and CS-20 Chip Screen. The installation was made at total cost of less than $27,000 excluding high pressure blower system to blow chips 620 ft. to open type gondola car.

Mr. Molpus says of this installation, "We believe this is the lowest cost barker-chipper-screen installation on the market, and it should pay for itself within one and one-half to two years."

IF you're burning waste — slabs, edgings, trimmings — you're missing out on real profits. Here's a minimum-investment installation that will make you

$13,578 to $55,515 profits annually — depending on size of your mill!

A woodwaste utilization installation is no longer just for the "big boys" — this new Soderhamn combination will put you "in the chips!" Efficient, clean barking and chipping . . . accurate, dependable screening — all to most rigid pulp mills' specifications.

TOTAL INVESTMENT LESS THAN $25,000

This is actually the lowest price heavy duty installation on the market. Three precision Soderhamn machines, designed for long life and economical, dependable operation . . . minimum labor, minimum horsepower requirements, minimum maintenance. You can't go wrong with Soderhamn — the line that is setting new standards for the industry.

- *Soderhamn also makes the lowest cost rotor barker on the market, considering installation and labor costs.*

NEW DC-6 LOG BARKER. Will handle efficiently logs from 5" to 36" diam., 6' to 22' long. Production up to 45,000 bd. ft. (Doyle scale) per shift may be reached under ideal conditions, although installation is profitable for mills cutting as low as 7,000 bd. ft. a day.

Interchangeable heads — flail scraper, abrader, and planer types — make it easy to meet all bark specifications. No conveyors needed — skids or live decks may be used for both infeed and outfeed; logs are fed sideways into the barker, and hydraulic kickers discharge barked logs to the rear. Kickers properly spaced to insure support for random length logs.

All movements controlled from one simple station, including start-stop buttons for all motors. Heavier construction than any other low-cost barker on the market. Weight, approximately 12,000 lbs.; cost, complete with all motors, $8,900.

Individual literature available.

48" HORIZONTAL CHIPPER. Adaptable to ground level mill, so no elevated conveyor required. Furnished with 3 high chrome alloy knives and special Soderhamn anvil knife of new, heavier design, affording four usable hard-faced cutting edges. Knives bolt into disc. Chip size readily altered. Average production, 20 cords per hour — more than ample for one barker and screen; weight, approximately 6000 lbs.; HP required, 75-125 depending on conditions; cost, $6,900 plus motor. (Motor can be quoted separately.)

Individual literature available.

CS-20 HORIZONTAL ROTATING CHIP SCREEN. Advanced design Chip Screen insuring quality production of chips — a *must* in today's market conditions. Delivers uniform chips, free of splinters and sawdust. No vertical movement — oversize chips and splinters cannot jump through top screen plate as on conventional chip screen. Chips, sawdust and oversize pieces discharged separately. Requires no ground foundation — suspended from cyclone supporting structure. Average production, 5 cords per hr.; weight, approx. 1600 lbs.; cost complete with 2 HP 1800 RPM motor — $2,200.

Individual literature available.

SODERHAMN MACHINE MANUFACTURING COMPANY

Talladega, Alabama

West Coast: Suite 3, 9442 S.W. Barbur Boulevard, Portland, Oregon.

East Canadian Representatives: Forano Limited, Montreal, Canada.

DID YOU GET YOUR COPY?

This brochure describes this 3-machine installation and tells how to figure your profits in advance . . . how to get in the chip business. Write for it now!

SODERHAMN — FIRST NAME IN WOODWASTE UTILIZATION EQUIPMENT

QUALITY DYES FOR PAPER

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PAPER

"Sandy Hill can fix it . . . here's their home phone card"

When a real mechanical problem comes up, the first thought in many mills is to get Sandy Hill on the phone right away.

Sandy Hill has a 100-year record of keeping its customers' machines and equipment operating with a minimum of interruption. This is accomplished in two ways:

1. Every Sandy Hill customer has a special directory (if you don't have yours, write for one) containing the *home* phone number (as well as the business phone) of 29 key men who are available at any hour of the day or night. Any one of these key men will help the customer handle an emergency — and stay with it until it's licked.
2. At the Sandy Hill plant, emergency jobs (as well as small orders in general) are processed immediately by a separate, independent department.

Write or phone for full information on any phase of Sandy Hill *service* to the pulp and paper industry. You'll agree . . . 100 years of experience makes a big difference!

THE
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IRON AND BRASS WORKS
HUDSON FALLS, N. Y.

BRIEFS for buyers of

Caustic Soda

Chlorine

Sodium Chlorate

Forty pages on handling caustic soda

If you count among your problems the handling and storing of caustic soda, you'll find this Hooker manual exceptionally helpful.

All its forty pages deal with safe and efficient caustic soda handling.

There are large, detailed diagrams of equipment and a section on materials of construction dealing with the corrosion problem.

There are recommendations for unloading, diluting, piping, and storing caustic soda without danger of contamination.

Eighteen graphs, charts, and tables help you predict and control the behavior of caustic soda under a wide range of operating conditions.

For a copy, just check the coupon for Bulletin 102, *Caustic Soda Engineering and Handling Guide.*

Wall chart shows how to handle chlorine

In simple language and diagrams, this Hooker chlorine wall chart tells how to handle chlorine safely.

Post it around your plant to help prevent accidents by showing your employees the most important *do's* and *don't's* of chlorine handling.

The chart explains the operation of tank car, ton container and cylinder valves, describes safe storage methods, and tells what to do in an emergency.

To get a copy, just ask your Hooker contact or send the coupon.

Sodium chlorate and chlorine dioxide literature

Since more pulp mills are generating chlorine dioxide each year, and since sodium chlorate is the starting point of the process, and since we make and sell more sodium chlorate than anybody else, we have tried to develop a program of technical bulletins on both chemicals which should prove helpful to pulp and paper people.

In this program we have enjoyed the inimitable assistance of Dr. W. H. Rapson, a pioneer in chlorine dioxide bleaching and a consultant to Hooker and Hooker customers.

Here are four current bulletins which should be of general interest:

Bulletin 99, Sodium Chlorate Handling Guide

Gives physical and chemical properties; precautions in handling and storage; unloading tank cars; valve assemblies; materials of construction; methods of analysis; pertinent graphs and diagrams.

Bulletin 205, A Comparison of Processes for the Generation of Chlorine Dioxide in Pulp Mills

by W. H. Rapson. Gives history and comparison of the six processes now in use for generating chlorine dioxide. Covers chemical reactions, equipment requirements, materials of construction, operating problems, material balance, and relative costs.

Bulletin 218, The Effect of Chlorine on Chlorine Dioxide Solutions for Bleaching Pulp

by W. H. Rapson and C. B. Anderson. Explains how the presence of chlorine can work to slightly brighten or to degrade pulp depending on relative strength in solution.

Bulletin 220, Chlorine Dioxide Bleaching Today

by W. H. Rapson. Discusses new developments, compares available processes, tells how many plants are using which processes; gives cost data and a discussion of chlorine dioxide's use with different grades and types of pulp.

For literature mentioned on this page check here:

- ☐ Bulletin 102, Caustic Soda Engineering and Handling Guide
- ☐ Chlorine Safety Wall Chart
- ☐ Bulletin 99, Sodium Chlorate Handling Guide
- ☐ Bulletin 205, A Comparison of Processes for the Generation of Chlorine Dioxide in Pulp Mills
- ☐ Bulletin 218, The Effect of Chlorine on Chlorine Dioxide Solutions for Bleaching Pulp
- ☐ Bulletin 220, Chlorine Dioxide Bleaching Today

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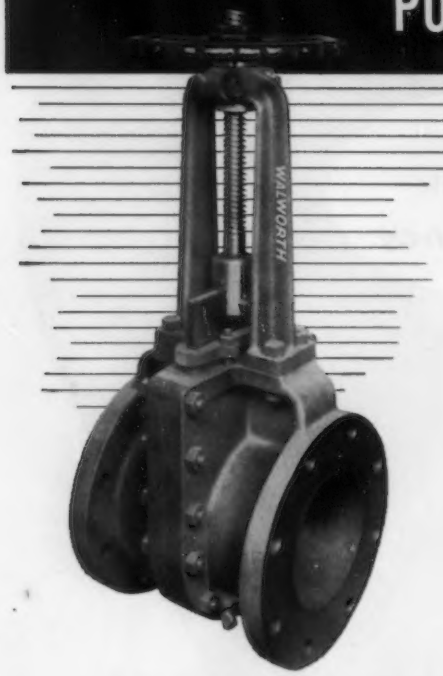

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Here's the valve that was developed especially for clogproof operation on stock lines. There are no recesses where pulp fibers can accumulate. Circular ports permit full flow. The sharp, flame-hardened edge of the semicircular stainless steel gate shears through the pulp stock to a tight, leakproof shutoff.

The No. 757F can be supplied in sizes 4" to 24" inclusive – in All Bronze, Iron Body with Bronze Trim, Iron Body with Stainless Steel Trim, All Stainless Steel construction. Complete information is available from your nearby Walworth Distributor – or – write Walworth direct for a free copy of the booklet, "Walworth Valves for Pulp and Paper Mill Service".

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WALWORTH BRONZE VALVES. These standardized lines of bronze valves provide an unsurpassed system of interchangeability of parts. Drastically reduces inventory problems.

WALWORTH PRESSURE-SEAL CAST STEEL VALVES. Ideal for high-pressure, high-temperature steam and boiler feed service. Internal line pressure is utilized to maintain a tight, leakproof body-to-bonnet connection, reducing bulk and weight of valve.

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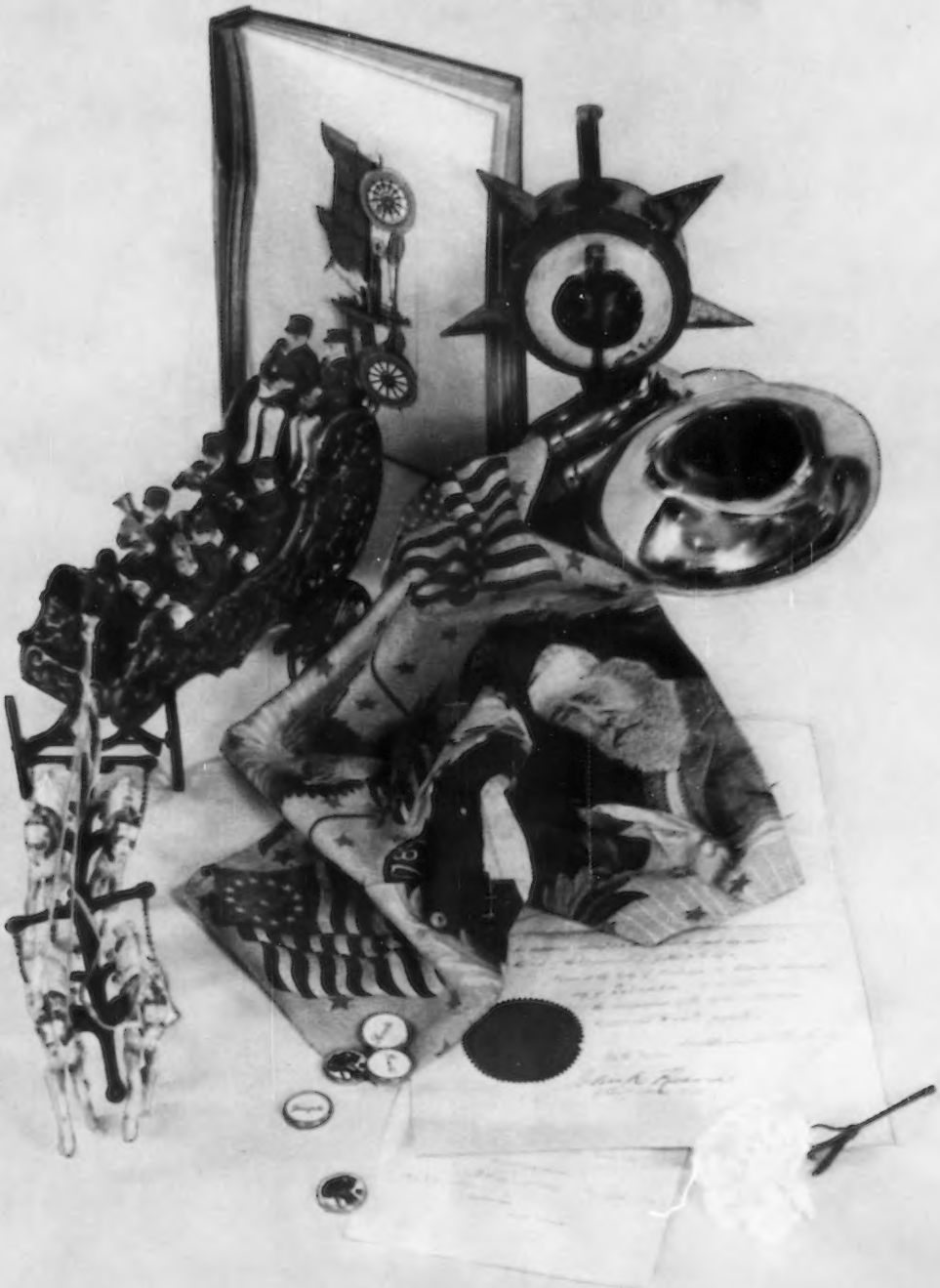

Authentic memorabilia from the "Gay 90's" courtesy The Henry Ford Museum

No. 7 of a series. LATEX COATED

Political parades at the turn of the century were gala, colorful affairs. Some of these colorful trappings are reproduced in color on the preceding page. Notice how these bright and varied colors faithfully reproduce on coated paper made with Dow Latex. In this instance, 80 lb. dull off-machine coated letterpress stock was used. Careful examination will show why only Dow Latex offers such an excellent printing surface.

For fine quality reproduction, specify latex coated papers

Dow Latex offers dramatic improvements to the printing surface of all grades of papers. It assures a clean, uniform sheet which is highly compatible to both offset and letterpress inks.

Printers prefer coated paper made with Dow Latex because they know it has the qualities which will assure sharp, clear reproduction every time. And paper manufacturers and converters find Dow Latex makes uniform quality production easier to obtain.

Major paper manufacturers are now offering many grades of quality coated papers made with Dow Latex. They use it for machine and off-machine coating for both dull and gloss grades. For more detailed information on coated paper using Dow Latex, check your paper supplier or write THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Dept. 2155.

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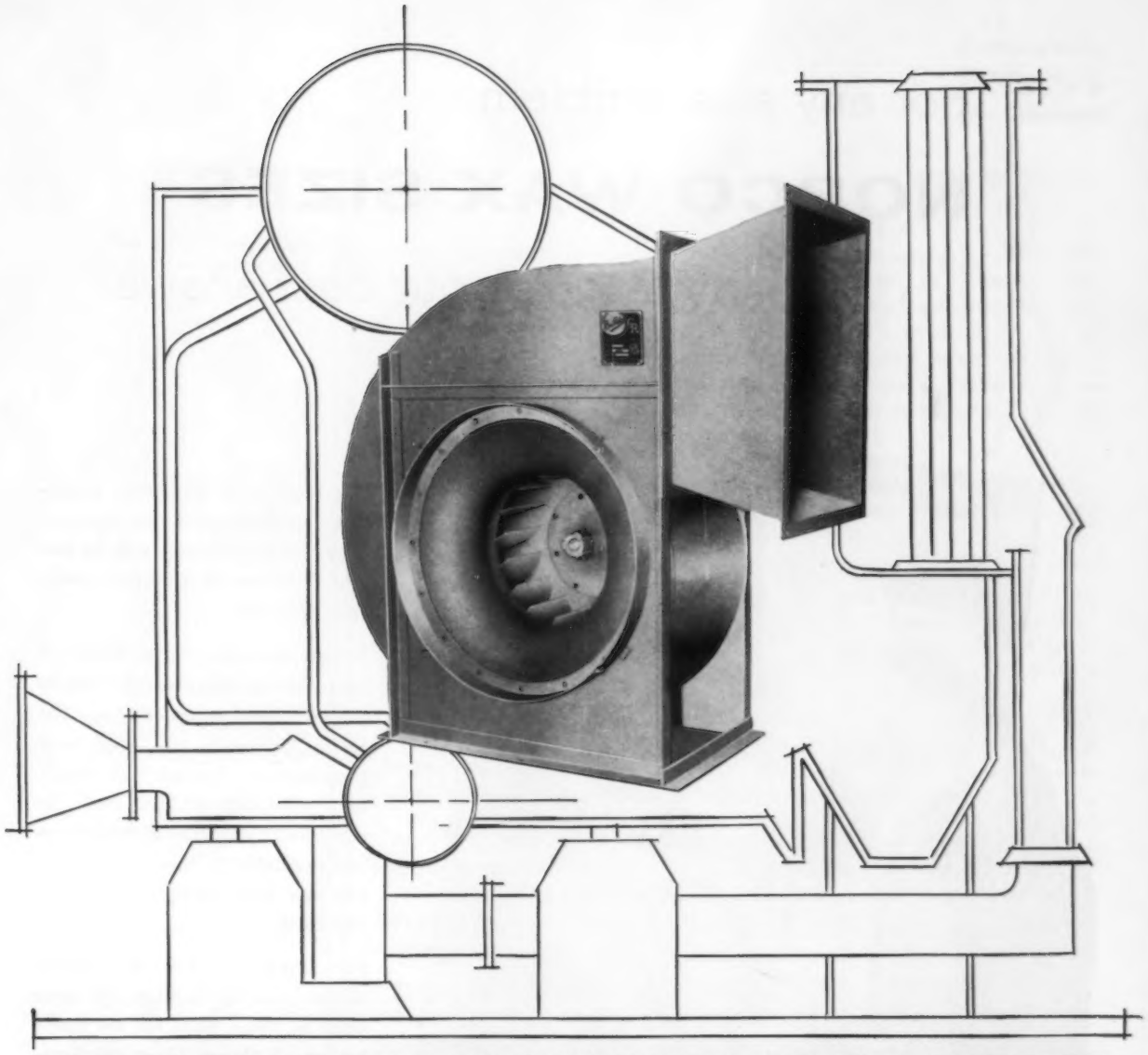

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Write for Bulletin FD 205 and see the dependable, stable performance built into this husky radial wheel fan for constant volume or inlet-dampered operation. It's one of a *series* of specialized "Buffalo" Draft Fans — including airfoil and backward curve designs with a wide choice of wheels — to give you the best service your operation requires.

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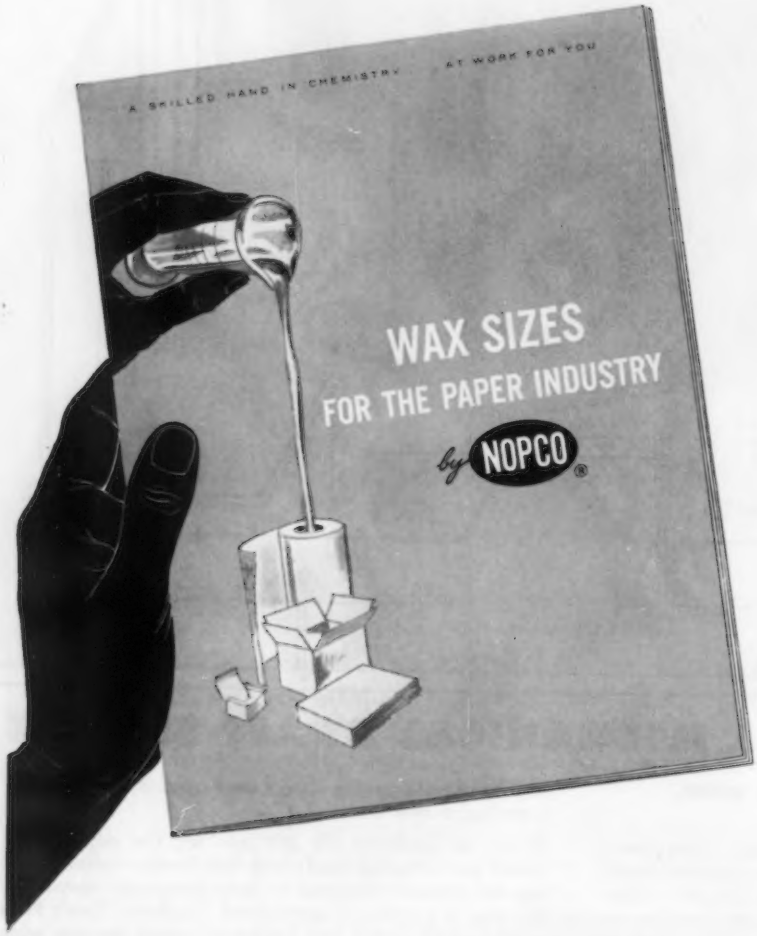

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Nopco wax sizes—the result of long and tireless research—assure positive wax retention on the fibers, thorough and even wax distribution through the sheet, high efficiency at low cost. As many as 21 different formulations are available to give your product any combination of properties needed.

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Our July Production Predictions Confirmed

Total paperboard production in July was nearly 6% above the same month last year, according to a U.S. Dept. of Commerce report issued in mid-September. This report, which provides the first totals and detailed figures, shows paperboard was ahead by 7.5%, paper up by 2.5% and construction paper and board up 11%. Among papers, only newsprint and machine coated failed to show tonnage increases for this July over the same month in 1957. In the paperboard group all divisions were up.

Recovery Data Accumulates

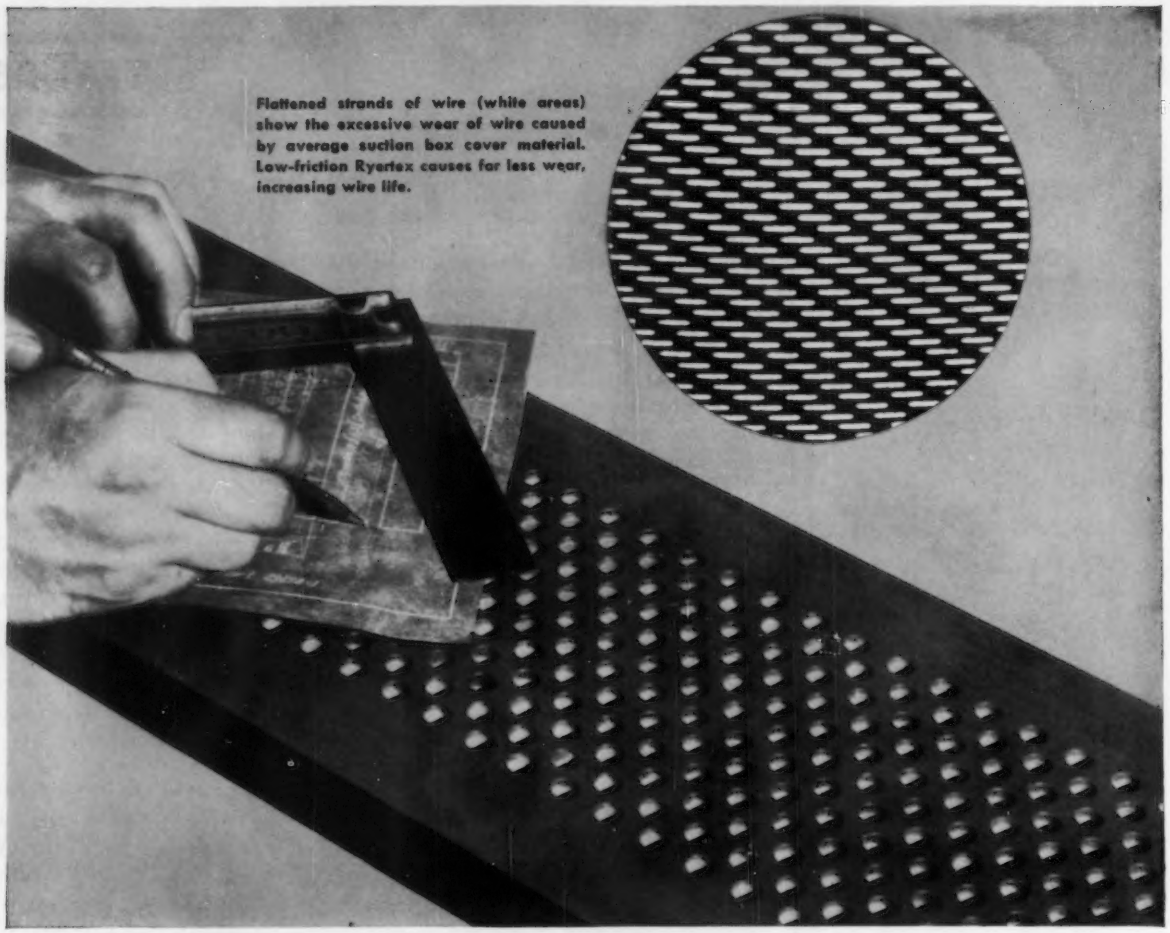
Further evidence in the strength and nature of the business recovery continue to pile up. According to a survey just completed by the U.S. Dept. of Commerce, we are on the verge of an upturn in business investment in plant and equipment.—Another indicating factor of general improvement is the decline in the rate of inventory liquidation. This liquidation has been an important characterstic of the recession.—The Federal Reserve Board has expressed the opinion that the recovery is of sufficient strength to warrant keeping a tight rein on further credit expansion.

Latest Per Capita Consumption Data

Phenomenal growth of the U.S. paper industry and the steady rise in per capita paper consumption since the turn of the century is graphically shown in the latest revised data issued by A.P.P.A. Total paper and board production in 1899 was 2,167,593 tons and for 1957 had risen to 30,677,548 tons. In this period, per capita consumption had increased from 57.9 lbs. to 412.0 lbs. The highest for both production and per capita consumption was 1956 when 31,441,192 tons were produced and 434.2 lbs. per capita were consumed.

Value Line Optimistic on Paper

"The paper industry is leading the way out of the recession." says "The Value Lines Investment Survey." Total production for the full year 1958 is expected to fall only a shade short of 1957. Earnings however will compare unfavorably with 1957. The paper industry has been unable to utilize fully its added capacity. Unit overhead costs (including depreciation and interest) have risen, but volume has not. In 1959, the expected rise in business activity, the Survey states, should carry total production of paper and paperboard from 5% to 7% above the record peak output of 1956, thereby absorbing much of the excess capacity. The industry's basic strength, the Survey notes, has been confirmed by its record during the recent recession. "The decline of only 4% of output in paper and paperboard in the first half of 1958 compares favorably with the drop of 11% in total industrial production." The high degree of integration obtained between timber supplies, output of primary papers and board and converting activities has enabled the major companies to maintain a relatively stable flow of production without resorting to price-cutting tactics. The Value Line Survey see the annual production volume of the paper industry over the next several years increasing at a faster rate than the growth of total industrial output, but also notes that paper company earnings are not immune to cyclical declines.


Flattened strands of wire (white areas) show the excessive wear of wire caused by average suction box cover material. Low-friction Ryertex causes far less wear, increasing wire life.

GET 25% MORE WIRE LIFE

Use Ryertex® suction box covers

At your wire's only point of drag—the suction box—you can reduce wire wear substantially by the use of job-proven Ryertex.

No other cover material has a lower coefficient of friction with water lubrication—less than 0.01, or about half that of wood covers under normal operating conditions. Wires slip so smoothly over Ryertex that their service life is increased as much as 25%—four wires doing the work of five. This means important wire savings.

Your covers last longer, too, because Ryertex is a phenolic, laminated-textile composition that is smooth, tough, long-lasting. When a leading paper mill tested Ryertex against two competitive materials, the Ryertex covers lasted three times as long as material A, 35 times as long as material B.

Because even the largest covers are made of one continuous piece of Ryertex, they may have any perforation pattern of holes or slots, straight or tapered, in any combination that works best for you.

Next time you replace suction box covers, forming boards or pipe covers, investigate Ryertex. Call your nearby Ryerson plant.

You will also find many marked advantages in Ryertex paper mill bearings.

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American Box Board to Acquire Wolverine

American Box Board Co. of Grand Rapids, Mich., plans to acquire Wolverine Carton Co., also of Grand Rapids.

American Box asked the Securities and Exchange Commission to register 49,732 shares of its $1 par common stock to be used in the acquisition, which has been approved by the boards of both companies.

Two shares of American will be offered for each share of Wolverine. The acquisition is conditioned upon acceptance of the offer by 95 per cent, or 23,623 shares, of Wolverine common. At American's option, however, the exchange could be declared effective when accepted by the holders of 80 per cent of Wolverine shares.

Wolverine will be operated as a wholly-owned subsidiary, American Box president Walter S. Goodspeed said. Russell H. Spees will continue as president of Wolverine and become a vice president and director of American Box.

Crowell Carton Completes Expansion

Crowell Carton Co., division of St. Regis Paper Co., has completed a $625,000 expansion and new equipment program at Marshall, Mich.

W. W. Finn, vice president, said that the work over the past year entailed $300,000 for plant expansion which tripled floor space and completely revamped production layout. Another $325,000 included installation of a five-color 36 by 48 inch, high speed Cottrell rotary press, a 36½ by 52 inch WUPA reciprocating platen cutter-creaser, both equipped with automatic Mabeg feed and pile delivery units.

This equipment, teamed with a 36 by 49 inch Miehle cutter, provides a virtual "single unit production center" offering a high degree of production flexibility in making industrial and consumer folding and set-up cartons, Mr. Finn said. Robert Hein, plant manager, was in charge of the installation.

Crowell is one of 14 production units in the Container Division of St. Regis Paper Co.

Union Bag-Camp Breaks Ground in Glens Falls

Ground was broken yesterday at Glens Falls, N. Y., for the construction of a plant of 50,000 sq. ft. for the Honeycomb Division of Union Bag-Camp Paper Corp., which will occupy it under a 25-year lease.

The building, of tilt-up concrete construction, is being erected by Fletcher-Thompson, Inc., of Bridgeport, Conn. Cross & Brown Co. of New York City negotiated the entire construction and lease transaction.

The plant, on a 10-acre plot, is the first to be built on the 85-acre tract owned by Finch, Pruyn & Co., Inc., in the southwest area of Glens Falls, served by the Delaware & Hudson Railroad.

Crossett Improving Water System

Crossett Co. has begun work on a $102,000 expansion of its stream improvement system.

The project, which will be completed early in the fall, includes the addition of two new fiber settling pools and alterations in the larger of two existing water impounding basins.

Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the United States production to mill capacity for the week ending September 6, 1958, was 68.5 per cent compared with 88.7 per cent revised for the preceding week. The ratio was 71.3 per cent for the corresponding week a year ago.

The paperboard production ratio for the week ending September 6, 1958, was 73 per cent compared with 95 per cent for the preceding week and 72 per cent for the corresponding week last year.

The low ratios for the week ending September 6 are due to Labor Day holiday shutdowns.

(Detailed statistics on page 31.)

Mt. Tom Corp. Seeks Financing

The Mt. Tom Development Corp., owner of the former Doeskin Products Inc. plant at Mt. Tom Junction, Mass., is awaiting an answer from an insurance company on a request for financing the proposed operation of the pulp mill. A final answer is not expected for at least two months.

The Mt. Tom plant, operated for many years by Doeskin Products Inc., closed down in March of 1957. After six months of speculation as to whether or not the plant would reopen, the Mt. Tom Development Corp. was formed and bought the factory.

Logan-Long Strike Settled

A strike which lasted more than six weeks was settled in Franklin, Ohio when management offer of a pay raise and fringe benefits was accepted by union employees of Logan-Long Co.

About 135 men were affected by the strike which started July 23 and ended September 5.

The settlement, accepted by United Paper Makers and Workers of America, AFL-CIO, by a vote of 44 to 34, includes: a five cent hourly wage increase the first year, a six cent pay boost per hour the following year, and vacation and hospitalization benefits.

The present scales, before accepting the new contract, called for pay of from $1.57 to $2.14 per hour according to classification of skills.

Kaukauna Celebrates Thilmany's 75th Year

The city of Kaukauna, Wis., lead by its mayor and Common Council, honored the Thilmany Pulp and Paper Co. September 20. The largest dining room in the city, located in Holy Cross school, was crowded with over 500 people honoring C. R. Seaborne, executive vice president. Special honors were given all Thilmany officials.

At a recent meeting of the Common Council, the mayor said "This anniversary is a continued story of a city, people, wood, paper and foresighted men, which combined together have brought economic security to all of us, and played such an important part in our city's development."

Canadian Production Figures

Canadian woodpulp production and shipments, owing to lower levels of paper and board output, were off in July and the first seven months.

Output in July was 792,265 tons as compared with the year ago figure of 847,763 tons. In the first seven months production totalled 5,681,785 tons as against 6,108,075 tons for the same period last year.

Shipments during the seven month period included 4,422,704 tons to Canadian users and 1,212,555 tons to export markets. This compares with domestic shipments of 4,750,389 tons and exports of 1,314,161 tons to the end of July last year.

Shipments to Canadian consumers in July were 632,654 tons while exports were 182,949 tons. In the same month last year domestic shipments were 677,172 tons and exports were 182,858 tons.

Canadian paperboard production was ahead in July and the first seven months owing largely to increased shipments of the boxboard grades.

Output for the month totalled 78,341 tons as compared with 74,402 tons a year ago. Included in this year's total were 34,626 tons of boxboard, up from 32,330 tons last year; and 43,715 tons of container board, as against 42,072 tons in 1957.

Production in the first seven months was 510,199 tons as compared with 509,429 last year. Of these totals boxboard accounted for 240,248 tons this year and 233,196 tons in 1957.

Domestic and export shipments increased too. Exports to the end of July were 46,652 tons of which 8,424 tons were exported in July. In July last year, exports were 5,909 tons and the total to the end of the month was 45,513 tons. Domestic shipments for the seven month period were 457,288 tons this year as compared with 454,952 tons in 1957.

Canadian wrapping paper production, including bag and other converting papers, during the first six months of 1958 was 138,205 tons as compared with 136,024 tons in the first half of 1957. During the period, the wrapping paper used in Canada was 125,263 tons as compared with 122,358 tons in 1957. Exports for the first half of the year jumped from 7,697 tons last year to 13,147 tons this year.

Canadian fine paper production and shipments gained in July but were off slightly in the first seven months.

July output was 21,276 tons, a gain of 4.8 per cent from the year ago figure of 20,306 tons. At the same time, shipments for the month were up 6.8 per cent at 19,982 tons as against 18,702 tons in 1957.

Production in the first seven months totalled 150,541 tons, off 1.3 per cent from the 152,557 tons produced in the same period last year.

Total shipments to the end of July were 149,100 tons this year as against 151,015 tons last year. Included were domestic shipments of 140,029 tons, as compared with 142,071 tons last year, and exports of 9,071 tons as against 8,944 tons in 1957.

Coated paper output in July was 2,592 tons as compared with 2,443 tons a year ago. Shipments for the month were 2,676 tons this year and 2,443 tons in 1957. In the first seven months, coated paper production totalled 17,688 tons and shipments 17,840 tons. For the same period last year production was 17,667 tons and shipments were 17,639 tons.

John R. Kimberly

Salesmen's Assn. to Honor Kimberly

The Salesmen's Assn. of the Paper Industry will sponsor a dinner in honor of John R. Kimberly, president of A.P.P.A. on October 16.

George M. Watson, Mead Papers, Inc., is chairman of the dinner committee. Mr. Kimberly, who is president of Kimberly-Clark Corp., will address the SAPIs and their guests after the dinner which will be held in the Savoy Hilton Hotel in New York. Paul C. Craig, president of the SAPI will preside.

Miami U. Receives Gift from Supts. Group

Development of a technical laboratory for Miami University's new course in pulp and paper techniques and chemistry has received a boost in the form of a $1,500 gift from the Miami Valley Section of the American Pulp & Paper Mill Superintendents Assn.

C. Edwin Brandon, who recently resigned as technical director of Howard Paper Mills, Inc., Dayton, Ohio to become director of the Miami program, said the gift will be applied to special equipment. A two-story brick building which formerly was the university's maintenance center is being remodeled to accommodate the laboratory. It is scheduled to be ready a year from now, when the class which inaugurated the new program a year ago achieves junior standing and is ready for specialized classes.

The $1,500 check was presented to Miami President John D. Millett recently by a Superintendents Assn. delegation including William Zimmerman and Russell Buck of the Sorg Paper Co. and William C. Martin, Moraine Paper Co.

Miami opened its pulp and paper course last September under industry sponsorship after Ohio TAPPI (Technical Association of the Pulp & Paper Industry) proposed such plan to both the university and industry officials. Approximately 20 Ohio firms are participating in an advisory committee as well as in such material support as providing scholarships, summer jobs and laboratory equipment.

Conn. Meeting to Discuss Quality Control

The Connecticut Valley Division of the Superintendents' Assn. and the New England Section of TAPPI will hold a joint fall two-day meeting at the Berkshire Inn, Great Barrington, Mass., October 3 and 4.

Topic for the two-day meeting is "Cost Reduction via Quality Control." Three paper mill men, Morris E. Blew, quality control engineer, Strathmore Paper Co., West Springfield, Mass.; John Lunt, quality control engineer, Boxboard Division, Continental Can Co., Haverhill, Mass.; and William Crosier, quality control supervisor, Byron Weston Co., Dalton, Mass., will be the manufacturing panel. Dorian Shainin, quality control consultant for Rath & Strong Co., Boston, Mass., will act as moderator.

Staley Awards Scholarships

Three college students specializing in pulp and paper technology will study under $500 scholarships provided by the A. E. Staley Manufacturing Co. this year. They are Edgar E. Moore of Doylestown, Ohio, a sophomore in the Department of Paper Technology at Western Michigan College; James H. Allen of Binghamton, N. Y., a senior in the Department of Pulp and Paper Technology at Syracuse University's State College of Forestry; and

Jacob Thigpen, Jr., of Dudley, N. C., a senior in the pulp and paper technology curriculum at North Carolina State College School of Forestry.

New President for Bowater's Nfld.

Mowbray Jones was appointed president of Bowater's Newfoundland Pulp & Paper Mills, Ltd., Corner Brook, Newfoundland, Canada, which is controlled by the parent through Bowater Corp. of North America Ltd., Canada. Mr. Jones has been associated for many years with Mersey Paper Co., Liverpool, N. S. which company was acquired by Bowaters last year.

Kepner Named H & D Production Manager

Edwin L. Kepner, assistant production manager at Hinde & Dauch, has been promoted to production manager, succeeding Willis E. Banister, who has retired after 44 years of service with the company.

Mr. Banister worked in both the St. Louis and Kansas City plants of the organization.

Mr. Kepner has been with the company 25 years.

Fleury Appointed to Burma Institute

Joseph E. Fleury, for 35 years professor and mill superintendent of the Paper Making Institute, Trois-Rivieres, Quebec, has been appointed to the staff of the Union of Burma Applied Research Institute in Rangoon.

Mr. Fleury has joined three other specialists from Armour Research Foundation of Illinois Institute of Technology, Chicago, who are assisting in the organization, staffing, and development of the Burmese research facility.

Mr. Fleury will advise the Burmese research staff on programs for making paper from such local materials as bamboo and rice straw.

A native of Canada, Mr. Fleury has been with the Paper Making Institute, a provincial government school, since its founding. He is on a two-year leave of absence for the Burma assignment.

In addition to teaching at the Paper Making Institute, he instigated and supervised an experimental paper making mill, and consulted on paper research projects for a number of different companies including work in Haiti, Cuba, Trinidad, Costa Rica, Honduras, Brazil, Peru, and Mexico.

James D. Moran

Flintkote Elects Asst. Vice President

James D. Moran has been elected assistant vice president of the Flintkote Co. He will serve as line assistant to Wilson Harvey, vice president and general manager of Flintkote's Pioneer (West Coast) Division with headquarters in Los Angeles. In addition, Mr. Moran will continue in charge of legal functions as well as supervise the Division's public relations, industrial relations and advertising department.

Flintkote, with headquarters in New York City, is a producer of box and paperboard, composition floor coverings, industrial lime, adhesives, paving and other industrial products as well as the broadest line of building materials in the U. S.

Mr. Moran joined Flintkote in New York in 1950 as assistant to the vice president and secretary, handling corporate legal matters. In 1954, he was transferred to the Pioneer Division as staff assistant to the vice president and general manager and in 1956 he was named director of public and industrial relations.

Senator Beckett Elected Director of Crystal

State Senator William Beckett, president of Beckett Paper Co., Hamilton, Ohio, has been elected a director of Crystal Tissue Co., Middletown, Ohio. He assumes the directorship formerly held by the late Henry J. Brandt of Chicago.

Mr. Beckett has been active in the paper industry for over 25 years and is a director of the Association of Pulp Consumers and a two-term past president of that association.

Great Northern Revamps Sales Command

Reorganization of Great Northern Paper Company's sales department to strengthen its services to customers for newsprint and specialty papers is announced by M. C. McDonald, president.

A. R. Caspar, a member of Great Northern's board of directors and executive committee, has been appointed vice president-marketing—with headquarters at the company's home offices in Bangor, Maine. Mr. Caspar, who joined Great Northern as an apprentice in 1919, was formerly vice president in charge of sales.

Robert A. Haak, formerly vice president-product development, has been named vice president and manager of sales, with headquarters in Great Northern's general sales offices, New York City. Mr. Haak, who joined the company as an apprentice in 1929, will also continue to supervise product development.

John A. Sayre, formerly manager of sales, becomes sales coordinator in the new sales organization. He will be in charge of customer services and sales training for Great Northern and will supervise its order, sample and mailing departments.

John H. Staples, formerly assistant to the president for sales, has been named assistant manager of sales-newsprint.

Howard Willets, a member of Great Northern's sales department since 1949, has been appointed assistant manager of sales-specialty papers.

Falls Paper Names Planner

Falls Paper and Power Co., Oconto, Wis., has named Alvin R. Pringle production planner. He formerly was finishing department superintendent. Edward F. Fish, formerly assistant finishing superintendent, becomes finishing superintendent.

Mr. Pringle joined the Falls Paper in 1949.

Mr. Fish was first employed at the Marinette Paper Co. in 1935, and later transferred to Oconto Falls in December 1951. In November 1953 he was selected finishing supervisor and named assistant finishing superintendent in September 1956.

Consolidated Names Development Chief

Dr. Sherwood G. Holt, formerly with Scott Paper Co. in Chester, Pa., has been named manager of the development department of Consolidated Water Power & Paper Co., Milwaukee., Wis.

Sales Changes at Crossett

R. H. Eggleston, assistant sales manager of the Crossett Paper Mills, Crossett, Ark., has resigned to accept a position in sales with Union Bag Co. at Cincinnati.

Jack Cullinane, former manager of the Bemis Bag plant at Crossett, is moving to St. Louis where he will be national sales manager for the Bemis Paper Specialty Co.

IP Appoints Copping to Otis Mill Post

Alan B. Copping has been appointed assistant manager at International Paper Co.'s Otis Mill in Chisholm, Maine, and Judson Hannigan Jr. has been named to replace him as assistant manager at the company's Hudson River mill in Corinth, N. Y.

Mr. Copping joined International in 1925 when that company purchased the Degrasse Paper Co. In subsequent years Mr. Copping worked at the Corner Brook Newfoundland mill as a sulphite superintendent; in Glens Falls, N. Y. as assistant director of research; and at Otis mill as technical superintendent. In 1939 he was transferred to the Hudson River mill on special assignment and in 1946 was appointed assistant manager which position he held until his present appointment.

Appointments at Sutherland Made

Ivan Forster, general superintendent for the Sutherland Paper Co. converting plants, has announced the following appointments and reassignments.

Douglas Martin, presently assistant superintendent of Sutherland's Specialty Division, has been appointed superintendent of that division.

Roy Scott, presently general shift foreman of the Specialty Division, has been appointed assistant superintendent of that division. Richard Dozier, superintendent of the Specialty Division, will assume the position of superintendent of North Side Converting Division 5. Gerald Foster, superintendent of North Side Converting Division 5, has been appointed to the position of superintendent of North Side Converting Division 9.

Edward Boram, superintendent of North Side Converting Division 9, will assume the newly-created post of "staff consultant for graphic arts processed." Mr. Boram's first assignment will be at the Fort Orange Paper Co., Castleton-on-Hudson, N. Y.

Dr. Sherwood G. Holt

Joins Consolidated as Development Manager

Dr. Sherwood G. Holt will join Consolidated Water Power & Paper Co. on October 6 as manager of the development department.

Mr. Holt has been employed by Scott Paper Co., Chester, Pa., as chief research engineer in charge of papermaking research. Prior to joining Scott in 1951 he was employed by E. I. du Pont Company as a research engineer.

Blake Joins Ludlow Papers

Ludlow Papers, Inc., has appointed William T. Blake marketing manager. He had been industrial products western sales manager of the Hudson Pulp & Paper Corp.

Trost to Retire

William F. Trost, plant purchasing agent of Continental Can Co.'s Tonawanda boxboard plant, Tonawanda, N. Y., will retire November 1, after forty years in the paper industry.

Tifft Promoted At Oxford Mill

Austin H. Tifft, formerly waste control supervisor for the Oxford Paper Co. mill at Rumford, Maine, has been promoted to supervisor of the Oxford technical service department.

He joined Oxford in 1950 as assistant group leader of the research department's pulping group. In 1953, he was promoted to group leader of the research's chemical engineering group, and in 1956 to waste control supervisor. Before joining Oxford, he had experience with the Buckford Research Laboratories, Avon, Conn.; the Research and Development Laboratories of Paulsboro, N. J.; and the Oklahoma Ordnance Works, Pryor, Okla.

Mr. Tifft succeeds Charles M. Koon, who has accepted a position as technical director with the Eastern Corp.

Fibre Box Assn. Re-elects Directors

Four directors have been re-elected by the Fibre Box Assn. They are John T. Harrison vice president, Union Bag-Camp Paper Corp.; Charles U. Harvey, general sales manager, Fibre Drum and Corrugated Box Div. of Continental Can Co.; Robert M. Briggs, general sales manager of Menasha Wooden Ware Corp.; and Ralph A. Wilkins, vice president, Bird and Son.

OBITUARIES

General Spaulding S. Bisbee, 68, vice president, assistant treasurer and director of Keyes Fibre Co., Waterville, Maine, died unexpectedly August 29.

General Bisbee had been with Keyes for 31 years and at the time of his death headed the firm's Portland Office.

John A. Borden Sr., 65, superintendent of printing for the Brown-Bailey Folding Box Co., died September 6 in Fitzgerald Mercy Hospital, Philadelphia, Pa.

Arthur E. Gove, 65, retired pulp mill superintendent at the Marinette Paper Co. in Marinette, Wis., died early this month.

Robert S. Williams, 36, paper mill superintendent of the Marathon Southern Corp., Naheola, Ala., died this month after a heart attack.

Edward F. Moody, 78, former sales manager of the Brown Co., Berlin, N. H., died in a Portland, Maine, hospital September 10.

Mr. Moody joined the paper making company in 1910. He was a founder and director of the Interlake Paper Co. of Canada and a past director of the Groveton Paper Co., Groveton, N. H.

Conrad W. Traut, 58, director of personnel services for Hinde & Dauch Paper Co., died early this month in Sandusky, Ohio.

Abe I. Gidwitz, 74, founder and president of the Globe Paper Box Co., Chicago, died September 4 in Michael Reese hospital.

Where Else Can You Get Such Good Fibre at Such Low Cost

The stock returned to the machine chest by the Bird Save-All has already been put through all that expensive preparation, and is all ready to be made into good, salable paper.

It's a *crime* to throw it away, particularly when a simple, inexpensive Bird Save-All recovery system delivers it at such low net cost per ton.

The Bird Save-All costs little to buy, install, operate and maintain. It needs no vacuum, no chemicals, no storage facilities, no auxiliary equipment. It automatically takes care of variations in volume of white water and proportion of stock in the water, without lost motion or waste of power.

Estimates of net return can be worked out for you *before* you make the investment. Let us show you how high this return can be.

BIRD MACHINE COMPANY South Walpole, Massachusetts

REGIONAL OFFICES: EVANSTON, ILLINOIS • PORTLAND, OREGON • ATLANTA 9, GEORGIA

Canadian Manufacturers of Bird Machinery, CANADIAN INGERSOLL-RAND CO., Limited, Montreal

The BIRD SAVE-ALL

Olin Mathieson to Build New K. C. Plant

Olin Mathieson Chemical Corp. will open a new corrugated container plant in Kansas City, Kan.

Kent Anderson, product manager for containers of the corporation's Packaging Division, stated Olin Mathieson's present Kansas City plant would be replaced. The expanded container manufacturing facility will be put in operation as part of a program to increase corrugated production within major market areas.

The new plant will contain a corrugating machine as well as the finishing equipment required to produce corrugated boxes of all sizes, weights and tests. Production from this corrugating machine will quadruple current production levels at Olin Mathieson's present Kansas City container plant.

Douglas Harrod, general manager of Olin Mathieson's Kansas City container operations, stated that the new building is 119,000 square feet in total area and described it as being unique in that it does not have a single column or partition. He also stated that the new plant will be serviced by the Union Pacific Railroad and will feature an inside railroad siding for leading and unloading box cars—as well as recessed and sheltered truck docks. The plant is expected to begin operation in the last quarter of this year.

The building was leased by Olin Mathieson from the Midwest Conveyor Co. The plant will service container users in Kansas, Missouri, Iowa, Nebraska, and parts of Oklahoma and Arkansas. Linerboard and corrugating medium for the operation will be shipped from Olin Mathieson's pulp and paper mill in West Monroe, La.

Earlier this year, Olin Mathieson opened a new corrugated container plant in Cincinnati, Ohio, and is presently building a new container plant in Joliet Ill., which is scheduled to begin operation in January, 1959.

Brown & Bigelow Purchase Heywood

Brown & Bigelow, Inc., through a wholly owned subsidiary, Quality Park Box Co., has purchased assets of Heywood Mfg. Co., Minneapolis. Heywood produces setup and folding boxes.

Dixie Cup Completes Brampton Plant

Completion of a $400,000 addition to its Brampton, Ont. plant has been announced by Dixie Cup Co. (Canada).

The addition increases the manufacturing area by 50 per cent and doubles the office space.

The company also has installed at the plant a 75,000 gallon gravity water tank in the form of a gaint Dixie cup. This is the second largest Dixie cup in the world. The largest is in Lexington, Kentucky, home of Dixie's newest plant.

Contractor was Milne & Nicholls, Ltd., Toronto, and the architect was N. A. Armstrong, Toronto.

Bemis Transfers Dept. to Fullerton

Bemis Brothers Bag Co. announced that its West Coast paper specialty department will soon be transferred to a separate plant in Fullerton, Calif. C. C. Cobb, resident manager of the St. Louis paper specialty plant, will be resident manager of the new plant, which Bemis will lease on a long-term basis.

Dinsmoor Co. Changes Owner

The 65-year-old George W. Dinsmoor Co., Lawrence, Mass. manufacturers of paper tubes, has been acquired by Bird & Sons, Inc., of East Walpole as a wholly-owned subsidiary and will continue the local operation without change in name or personnel.

Robert A. Watters, president-treasurer and general manager of Dinsmoor Co., disclosed the sale of stock. He will continue as president and general manager.

The late George W. Dinsmoor started the plant in 1893 and it was incorporated in 1933. At his death in 1944, he left the company to nine employees, seven of whom are still active in the conduct of the company.

It was announced that Bird & Son will continue to operate the local plant as a separate corporation.

Keyes Chi Appointment

Keyes Fibre Co., Waterville, Maine has appointed Roy Donovan assistant product sales manager. He will be located in Chicago.

Modern Packages Management Changes

Management changes and affiliation with Modern Packages, Inc., have been announced by Kansas City Central Paper Box Co.

Philip J. Close, partner in the law firm of Hook and Close, has been elected president. Robert Evans was elected vice president and treasurer and Thomas M. Cockrell was named secretary.

Ernest L. Bailey, formerly president of Modern Packages, has been appointed sales manager of Kansas City Central Paper Box Co. Mrs. N. S. House has retired as vice president and general manager and has been succeeded by Charles H. Leonhard.

Directors of the company are Dick Richardson, L. D. Williams, Paul M. Fogel, Lyle A. Works and Mr. Evans.

Lowe Elected Veep of Birmingham Paper

Guy Lowe, president of the Nifty Tablet Manufacturing Co. at Houston, Tex., for the past eight years, has been elected vice president of the tablet division of the Birmingham Paper Co., parent company of the Houston subsidiary.

Mr. Lowe will fill a newly created position in Birmingham.

In Houston, he will be succeeded by Melbourne L. Berlinger, who has been named general manager of the Houston subsidiary.

Container Corp. Names Cleveland Plant Manager

James J. Sommers has been appointed plant manager of Container Corp. of America's corrugated shipping container plant at Cleveland, Ohio.

Mr. Sommers joined Container Corp. in 1950 as an internal auditor, and in 1951 was made manager of the Chicago office of Pioneer Paper Stock Co., a wholly-owned subsidiary. In 1954, he was transferred to a similar post at the Fernandina Beach, Fla., shipping container plant. Since 1956, he has been controller at the company's Anderson, Ind., container plant.

Firms Merge

Sterling Container & Paper Co. and Murphy Corrugated Specialties Co., Chicago, have merged and will operate under the name of Sterling Container Corp. Officers of the company are Albert Blackman, president, and Maurice Waxman, secretary-treasurer.

Carton Industry Gives Award to Sutherland

The Folding Paper Box Assn. of America has presented its Directors' Safety Award to the Sutherland Paper Co., Kalamazoo, Mich.

The award is based on a member company's achievement of a million consecutive man hours of work without a disabling or work-loss injury. This presentation to Sutherland marks the third consecutive million injury-free man hours logged by the carton manufacturer.

While other safety awards are presented annually by the association, the Directors' Safety Award is given as often throughout the year as it is earned. Small carton companies, which are not staffed to produce millions of man hours of work as rapidly as the large manufacturers, may earn the Directors' Safety Award for five consecutive years of safe operation, regardless of number of man hours worked.

Standard Packaging Moves Corporate Offices

The corporate offices of Standard Packaging Corp. have moved into 18,000 sq. ft. of space on two floors of the new J. P. Lorillard Building, 200 East 42nd St., New York 17, N. Y.

According to R. Carl Chandler chairman of the board, the move was made to consolidate the administrative and sales offices of Standard's many divisions, including those formed through the recent merger with Eastern Corp. Prior to the move, Standard had been a five-year tenant in the French Building, 551 Fifth Ave., New York City.

Standard Packaging, which has more than tripled its business in the last three years, to attain an annual sales rate of approximately $80 million, produces paper, film, foil and paperboard packaging. In addition, the various divisions of the company produce a wide range of products including fine papers, paper plates and bowls, aluminum foils and household paper goods.

Carpenter Paper Buy Building

Carpenter Paper Co. has purchased the property and buildings of Michigan Wheel Co., Grand Rapids, Mich. and will move into its new quarters probably in February, it was announced by L. V. Mulnix, sr., president and general manager.

The move will give the paper firm approximately 20,000 square feet more operating space.

Dairypak Changes Name

The name of Dairypak, Inc., a jointly owned subsidiary of the Champion Paper and Fibre Co. and the Diamond Gardner Corp., has been changed to Dairypak Butler, Inc.

Dairypak Butler, Inc., with general offices in Cleveland, manufactures milk cartons and paraffined cartons for a variety of dairy products.

The company acquired Butler Paper Products Co., Toledo, Ohio, in 1956 and since then there has been a gradual integration of Butler staff functions into the parent company.

Hoerner Names MacDougall to Keokuk

M. P. MacDougall, who has had charge of labor relations, purchasing and public relations for Hoerner Boxes, Inc., which has a Sand Springs, Okla., plant, has been named acting general manager of the company's Keokok, Iowa, plant. He replaces Edward H. Fienning, vice president, who has resigned.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1958	Aug. 9 89.0	Aug. 16 90.5	Aug. 23 91.1	Aug. 30 88.7r	Sept. 6 68.5
1957	Aug. 10 90.1	Aug. 17 91.6	Aug. 24 92.2	Aug. 31 89.6	Sept. 7 71.3

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1957	94.2	97.0	97.1	94.0	94.6	93.3	75.6	90.7	86.0	93.0	90.7	81.5	90.9
1958	86.9	89.5	89.5	88.1	86.4‡	86.2‡	76.0‡	89.8‡	—	—	—	—	—

‡Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1951	1952	1953	1954	1955	1956	1957	1958
Year to Date	99.2	90.5	92.9	91.2	94.4	98.4	91.2	85.4
Year Average	98.0	88.6	92.3	91.6	94.0	97.9	90.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

1958	Aug. 9 92	Aug. 16 93	Aug. 23 92	Aug. 30 95	Sept. 6 73
1957	Aug. 10 92	Aug. 17 94	Aug. 24 95	Aug. 31 95	Sept. 7 72

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	80	86	88	84	84	86	76	93	—	—	—	—	—
1957	91	94	94	92	93	91	72	94	91	97	92	79	90

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING Sept. 6, 1958 (Includes Labor Day Holiday)	LAST WEEK ENDING August 30, 1958	CUMULATIVE TO DATE Jan. 1 to Sept. 6, 1958
% Activity	73%	95%	84%
	Tons	*Tons*	*Tons*
Total Production	218,998	307,590	9,271,506
Liner	62,450	104,573	3,053,996
Corrugating Material	36,317	46,472	1,390,745
Chip & Filler Board	5,104	4,211	170,733
Total Containerboard	103,871	155,256	4,615,474
Folding	43,833	60,712	1,800,675
Set-Up	10,415	12,405	370,989
Special Food Board	18,528	30,161	882,046
Other	42,351	49,056	1,602,322
Total Boxboard	115,127	152,334	4,656,032
Total Orders	*Tons*	*Tons*	*Tons*
Received	315,720	299,431	
Unfilled End of Week	508,828	407,334	

How to Set Up an Effective Maintenance Control Program

Maintenance can't get out of hand if you follow the basic principles outlined below.

Bert Carson
Maintenance Planning Department
Hudson Pulp and Paper Corp.
Palatka, Fla.

There are as many different maintenance control systems in industry as there are maintenance control supervisors. However, all effective maintenance control programs must be founded on the same basic principles to obtain effective control of:

1—Maintenance manpower.
2—Maintenance cost.
3—Product output.

Work Orders

The method whereby information on "what is to be done" is conveyed to the man who is to do the work is an all-important factor. The standing job order being the course of least resistance, it is often used. In most all cases it is abused. In analyzing the standing job order, we find its main appeal to be its elimination of the so-called delay due to unnecessary paper work. The questions here arise: Is that paper work unnecessary? Can we afford to eliminate it? What do we lose when we eliminate the paper work?

The answers to these questions are that in most cases we lose:

1—A description of the repairs that were made.
2—The actual identification of the equipment worked on.
3—Supplies and parts used, in reference to a particular piece of equipment.
4—In most all cases we have a bogus labor hour charge.

In other words the standing job order, if not properly controlled, is a means for hiding maintenance department inefficiencies. However, if properly controlled, it can be a real asset to the maintenance control system.

In order to reap the benefits of the standing job order, we must:

1—Set a definite limit on the maximum labor hours, and supplies to be expended.
2—Insist that the equipment code and numbers appear on the repair man's time card and any storeroom requisition for supplies used.

If the job order is written, it can be a document for effective control of maintenance manpower, maintenance records, and also for clearly conveying the orders of work to be done, from the operating superintendent, to the maintenance supervisors, to the mechanic who will perform the work. It can control maintenance manpower, because there is an estimated time specified, and enable the maintenance scheduler to effectively schedule the work in accordance with the available manpower. It can give control of records, because there is a permanent record of the actual repairs made, the time spent, the labor, and cost of supplier. These records can be referenced to each individual piece of equipment. The written job order can also specify the repairs requested by the operating superintendent. By using it, there are no verbal orders to become confused, as they are when passed via word of mouth down the line to the mechanic. The mechanic will have a detailed description of repairs which he is expected to perform, directly from the operating superintendent. The maintenance supervisor will know what is to be done, and the approximate time and material required to effect these repairs.

Job Order Design

The design of a maintenance job order is an important factor. Careful consideration should be employed; nothing can be left to chance. Yet, the primary thought must be simplicity.

The job order should be designed as a source document for:

1—Maintenance cost control.
2—The effective use of maintenance manpower.
3—The maintenance records.
4—Maintenance budget forecasting.
5—Persons requesting and authorizing the work.
6—Work requested, versus actual work done.
7—The mechanic who did the work.
8—The maintenance supervisor who approved the job, after it was completed.
9—The date the work was requested.
10—The date the work was completed.

Equipment Identification

For records keeping, it is always wise to identify the equipment. There are several methods of doing this, the simplest being to segregate the equipment only in so far as mechanical and electrical factors are involved. In this method only two code letters are necessary; the most commonly used are —M— for mechanical, and —E— for electrical. These code letters are followed by a serialized number. In some cases the first digit in the equipment number is used to reflect the location of the equipment in respect to cost center.

It is a good policy to imprint these codes and numbers on a metal plate and rivet the plate to the equipment it identifies. This insures permanent, positive identification, for the normal life of the equipment.

The Plant Plat

A plat should be drawn locating the

equipment in respect to its location in the plant. Each department should be separated and a plat drawn for each floor of that department. The major pieces of equipment should be shown with every auxiliary in its proper location in respect to the major equipment. Each page of the plat should be sectioned off as a map whereby the equipment could be located from a separate index.

The Plat Index

The equipment should be indexed by type and size regardless of its location. This index should carry for each individual piece of equipment:

1—The equipment code and number.
2—The manufacturer's name.
3—The equipment nomenclature.
4—Its location with reference to the plat, i.e., page number and section.

When coded equipment is moved from its prescribed location and replaced with spare equipment the plat and its index should be brought up to date. Copies of the plat should be kept in the offices of the plant engineer, the master mechanic, the chief electrician and the maintenance control department.

The use of the plat saves many hours during the course of a year in being able to locate equipment. The plat also serves the maintenance scheduler in helping him to concentrate the working force during shutdown periods. When an emergency breakdown occurs, the plat tells the maintenance scheduler at a glance what other equipment is affected. Armed with this information the maintenance scheduler can clean up other shutdown work in this area while the emergency repairs are being made.

Maintenance Records

Maintenance records should be kept on each piece of equipment vital to production. These records should depict maintenance labor and supplies expended on each piece of equipment. Thus the maintenance records are a factual source of information for replacements and alterations. The maintenance clerk can furnish the plant engineer or the operating superintendents with this information when the efficiency of the equipment is in doubt.

The Maintenance Stop Order

Should the expenditures on any piece of equipment approach or exceed reasonable limits, a maintenance stop order is issued by the plant engineer. This stop order means that only routine maintenance will be accepted by the maintenance control department until such time as a decision is reached and the stop order removed.

Maintenance Control Organization

The personnel in the maintenance control department will be in direct proportion to the degree of efficiency incorporated into the system, and the size of the maintenance crew controlled.

Maintenance Control Administrator

The department is usually under the direct supervision of a maintenance control administrator. His duty will be to coordinate both maintenance planning and scheduling, and the maintenance cost control and maintenance records. In some systems we find the maintenance planner responsible for this function. When we find the maintenance planner responsible for the department, his assistant usually coordinates the cost and records systems along with a preventive maintenance program.

Assistant Maintenance Planner

The assistant planner will relieve the planner of the duties of coordinating the maintenance cost and records systems. From the equipment history records he will assist the maintenance planner in setting up preventive maintenance and the oiling and lubrication scheduling systems. Keeping the plant plat and its index up to date will also be one of his duties. He will be responsible for all job orders which are not ready for scheduling, such as those jobs awaiting the proper approval, awaiting the arrival of material, awaiting plant shutdown, etc.

The Maintenance Scheduler

The maintenance scheduler will relieve the maintenance planner of the duties of scheduling all work. His duties includes shutdown planning, day to day scheduling and the operations of both the preventive maintenance and the oiling and lubrication scheduling, plus the maintenance backlog records.

The Maintenance Dispatcher

The maintenance dispatcher is responsible to the maintenance scheduler. It will be his duty to assist in the scheduling of work. His duties will consist of checking with the storeroom for spare parts and materials for job requests, before those job orders are issued to the maintenance crews. He will be responsible for labor and supplies estimates from the maintenance supervisors. He will keep the maintenance back log records and report to the maintenance scheduler so that the regular maintenance analysis report can be compiled. This report is issued by the maintenance planner.

Maintenance Costs and Records Clerks

The clerks who keep the maintenance costs and records are responsible to the assistant planner for all costs and equipment history records, cost reports, job order analysis reports, and maintenance cost trends. The posting to the preventive maintenance and the oiling and lubrication records are also their duties.

Typist and File Clerk

The typist and file clerk will type, mimeograph and assemble all work schedules, keeping a record of the scheduling of work.

Maintenance Supplies and Spare Parts Control

The relationship which maintenance parts and supplies have to control of

"Someone up here have conveyor trouble a while back?"

maintenance manpower is obvious. The maintenance supplies and spare parts control should be a direct responsibility of the maintenance control department, reporting to the plant engineer. Having these maintenance items controlled from any other source serves to create confusion and delays to the entire production process.

Where maintenance parts and supplies are properly controlled, the maintenance supervisors are relieved of the necessity of having to invent last minute patch up parts to expedite the work. No job order should be scheduled for work without the assurance that the necessary parts and supplies are available to complete the job.

The first function in controlling maintenance spare parts and supplies is the actual listing and analyzing of each group. All spare parts, which are stock items and regularly kept in the storeroom, should be associated with a particular piece of equipment or group of equipment and listed in its proper order. The maintenance supplies which are regularly stocked in the storeroom should be listed in their proper order. These supplies and spare parts should be carefully analyzed, as to the frequency of their use, and the amount of stock which should be kept on hand for the most efficient and economical operation of the plant. The spare parts should also be analyzed in regard to being current items. Where the maintenance supplies and spare parts inventory exceeds reasonable limits, the spare parts are usually found to be the culprit. The storeroom supervisor, in most cases, is a materials man and does not question the spare parts which are ordered by the maintenance engineers or the maintenance foremen. Frequently, parts and supplies are ordered for a particular machine, and for one reason or another are not used. The machine is often altered to the point that the original spare parts become obsolete, or in some cases, it is even removed and disposed of. In all too many instances, the maintenance engineer who disposes of, or alters, the machine neglects to check with the storeroom supervisor on the spare parts which are being carried and make some disposition of them. The accumulation of the obsolete parts over a period of years will cause the maintenance stores inventory to reach astounding figures.

Traveling Purchase Requisition

One of the surest and most economical means for policing the maintenance stock items is the traveling purchase requisition. The traveling purchase requisition originates with the supply room records clerks. Each item in the supplies records files which is being stocked for the maintenance of the plant, should be logged on the traveling purchase requisition. The quantities which have been purchased over the past several months should be listed, also the withdrawals, the price of the parts, vendor's name, and location. Columns for establishing minimum and maximum quantities are necessary. The traveling purchase requisitions should then be forwarded to the maintenance controller, who will review each item and set minimum and maximum quantities after consulting with the maintenance supervisors. These requisitions should then receive the approval of the plant engineer. Once the minimum and maximum quantities have been established, the frequency of reorders and withdrawals should be reviewed by the maintenance controller in coordination with the plant engineer. When the frequency of reorder changes, the minimum and maximum quantities should be changed to conform with the new trend.

When new equipment is added, the project engineer should set up spare parts requirements and request the supplies records clerk to institute a traveling purchase requisition for each item. A perpetual stock count should be made in the storeroom and checked against the traveling purchase requisition posting cards for accuracy. As parts and supplies are withdrawn, these withdrawals should be deducted from stock on hand and when the minimum is reached the traveling purchase requisition should be issued for reorder. Once the supplies warehouse has a traveling purchase requisition for all supplies and spare parts, these requisitions can be put through the machine accounting system and a listing made for the plant engineer, the storeroom supervisor, the maintenance supervisors and the maintenance control department.

The approval of the plant engineer should be mandatory before any maintenance item is set up in the supply room as a stock item. Parts and supplies purchased for the installation of a specific piece of equipment should be ordered on a special purchase requisition, and not logged with the regular maintenance stock items. These special purchases should be listed on the machine accounting system. The plant engineer and the maintenance control supervisor should be furnished with such a list each quarter. The supplies inventory should be checked for withdrawals of these purchases. If these purchases have not been withdrawn the originator of the special purchase requisition should furnish a legitimate reason. If storeroom stocks are policed in the above prescribed manner there can be no excuse for excessive maintenance stores inventories.

Supplies and Spare Parts List

In the estimating of job orders, the maintenance supervisors lean on the supplies and spare parts lists for the price per unit. After compiling a list of parts and supplies needed to do the job, the maintenance supervisor can give an accurate cost of materials estimate. This estimate in conjunction with the total estimated man hours is a reliable forecast of the cost of the job before the job is released by the maintenance scheduler for work. In checking the supplies and spare parts list, the maintenance supervisor notes the availability of materials necessary to do the

"Since my term started I figure I've saved $7,000 in payroll deductions."

The DRAPER Felt
DRAPER BROTHERS COMPANY
CANTON, MASS.

job. If materials are required that do not appear on the list as stock items, the maintenance supervisor should institute a special purchase request. This request should be clipped to the job order along with the job estimate slip and forwarded to the maintenance control department. The job order will be marked waiting material and filed in the inactive backlog until such time as the material arrival slip is received. The job order can then be processed. The plant engineer should approve all special purchase requests for maintenance parts and supplies.

Planning and Scheduling

In planning and scheduling we have the nucleus of the maintenance control system. The effective control of the maintenance manpower depends almost entirely on the efficiency of this part of the system. The effectiveness of maintenance planning and scheduling depends for the most part upon the cooperation which the maintenance control department receives from the management team. Getting the work requests to the maintenance scheduler as far in advance as possible enables the maintenance supervisors to estimate the scope of the job, time and materials involved, and lay out the best plan of action. Then, the maintenance scheduler has the advantage of scheduling the work when it can be performed with the greatest efficiency. If the job is of a shutdown nature the maintenance supervisor will have time to get all fabrication work ready, then when the shutdown comes maintenance will require a minimum length of time on each job, consequently more work can be done in a short period of time.

Daily Work Schedule

The maintenance control department, through the maintenance scheduler, should issue a daily work schedule for each maintenance supervisor. The number of job orders appearing on this schedule will be governed by the man hour requirements and the available man hours. The job requests which are of the most importance to production should be scheduled first, then spare parts fabrication, and fill in items. The daily schedule for each maintenance supervisor should be made flexible enough that manpower will be available for emergency and unscheduled job orders. At least one man in each crew should be assigned to parts fabrication, or fill in work such as salvage; this man will be in the maintenance shop where the maintenance supervisor can reassign him at any time. Usually the most able mechanic is kept available.

Preventive Maintenance

The preventive maintenance inspections, being relatively consistent, may be scheduled a week in advance. The preventive maintenance overhaul and repair jobs should be a part of the daily schedule as they require a more concentrated effort, and usually the shutdown of a piece of production equipment.

Oiling and Lubrication Scheduling

Once the procedure and system has been set up, the oiling and lubrication of equipment becomes a routine, and 90 per cent of this work can be done without the necessity of shutdown. The scheduling of the lubrication crew can be done with safety on a weekly basis, taking care that the changing of lubricants is done only when the equipment can be shut down.

Shutdown Scheduling

The scheduling of shutdown jobs is the most intricate of the scheduling systems. Several factors must be taken into consideration.

A running backlog should be kept by the maintenance scheduler for shutdown job orders on each operation. When the estimated man hours reach predetermined manpower requirements, a list should be printed with shutdown time forecast. The plant engineer, the department superintendent whose department is affected, and the maintenance planner should meet for the purpose of discussing these jobs and the shutdown time required. Priorities should be set on each job by the department superintendent. The list of job orders with manpower estimate and priorities should be furnished the plant engineer. A firm time should be set for the shutdown.

The maintenance control department should then proceed with planning the shutdown. The shutdown jobs requiring fabrication should be scheduled in advance. Outside engineering services if required should be alerted. The maintenance scheduler working with the maintenance supervisors should reevaluate the job estimates, removing man hour estimates for fabrication and other preparations, and leaving only man hour requirements for the shutdown itself.

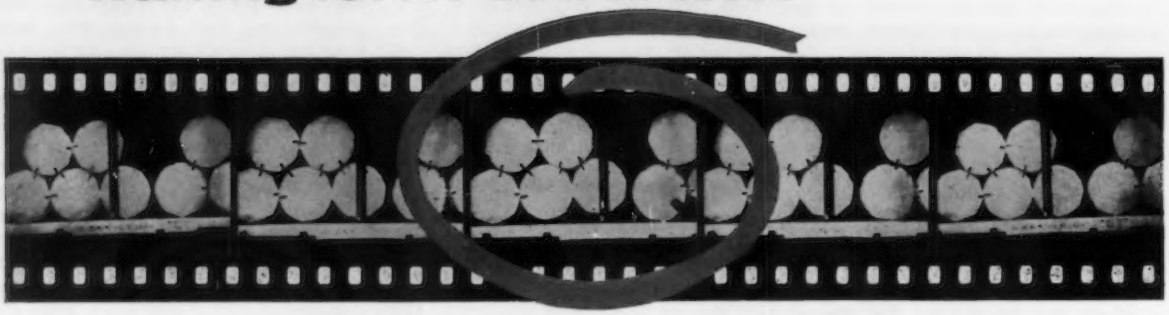
The maintenance planner, the assistant planner and the maintenance scheduler should formulate a firm shutdown schedule and submit it to the plant engineer who will secure the necessary approvals. The shutdown schedule should then be published and no other job taken without the approval of the general superintendent and the plant engineer.

Long Range Shutdown Forecasting

An intelligent forecast can be made with the experience gathered from the equipment files in the maintenance control department, in respect to future shutdowns.

Shutdown requirements can be forecast as far in advance as one year, with a high degree of accuracy. Armed with this information the general superintendent and the plant engineer can set dates for the shutdowns. Also, the maintenance control department is in a position to effectively plan and schedule the plant shutdown work, whereby the least amount of production is lost and the highest efficiency is realized from the maintenance manpower.

Waiting for... WHAM!



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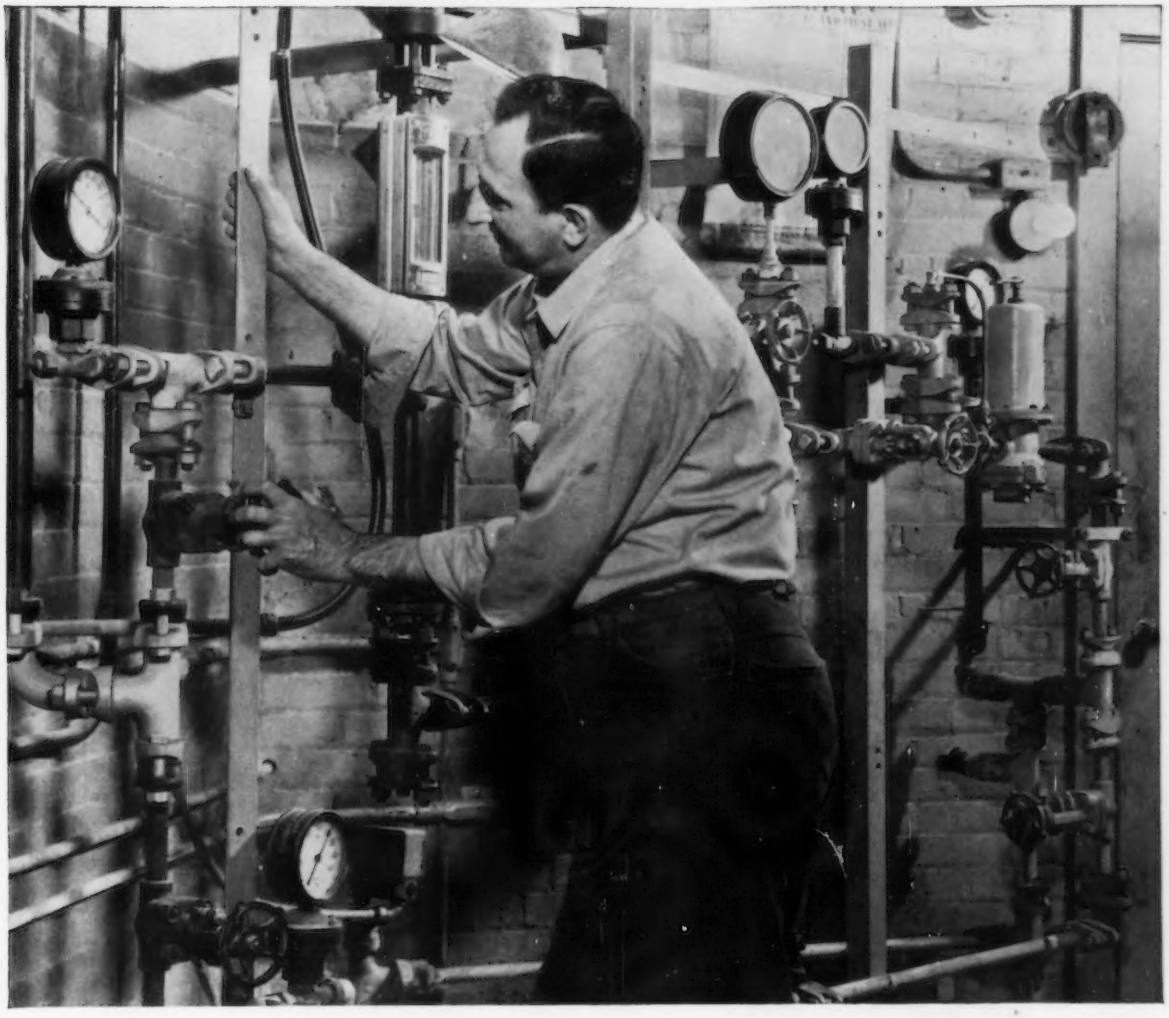


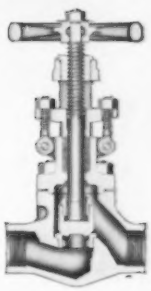
Crane Chlorine Valve Passes 10th Repair-Free Year on Chlorine Gas Throttling

Every time an operator opens or closes the Crane chlorine valve shown above, the Bergstrom Paper Company, Neenah, Wisconsin, is paid another dividend on an investment in service made more than 10 years ago!

This Crane No. 1644 forged steel globe valve is designed especially for chlorine gas or liquid service. In the Bergstrom plant it is used as a throttling valve to control and regulate chlorine gas pressure.

With the exception of a change-over to Teflon packing, this valve has needed no maintenance or repairs in ten years. It operates easily and closes tightly, and permits accurate, close, and safe control of chlorine gas. The record of this and other Crane chlorine valves has led the Bergstrom mill to standardize on the No. 1644 for all chlorine handling.

Ask your Crane Representative about this and other lines of Crane valves for handling hazardous and corrosive chemicals and liquors in your mill.



This rugged forged steel chlorine valve has Hastelloy "C" trim and Teflon packing. Globe or angle patterns; screwed or flanged ends.

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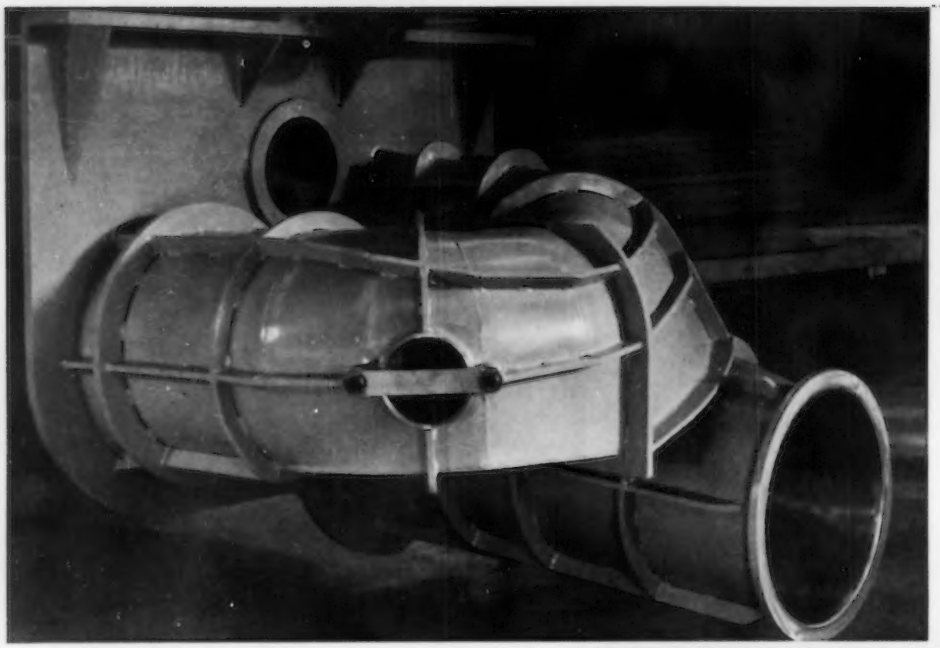
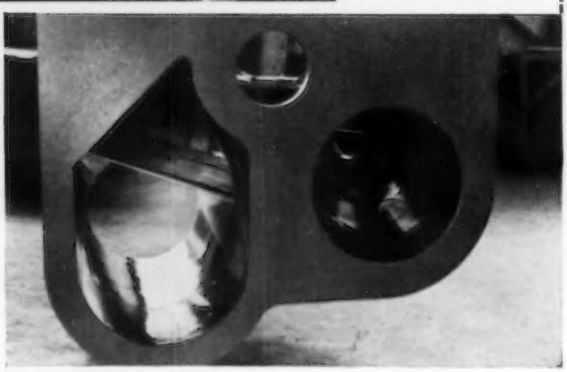
How Armco ELC Stainless Steel Can Save You Money



Armco 18-12 Mo ELC (extra low carbon) Stainless Steel proves more economical than casting made of another metal. Maze of compound curves creates no problems in forming 11 gage stainless.



Welded Armco 18-12 Mo ELC (Type 316 L) Stainless Steel in stock transfer unit replaces non-ferrous casting at a considerable saving in cost. Reason: Castings require expensive machining for smooth interior, proper fit. Stainless steel sheets don't.

Furthermore, Armco 18-12 Mo ELC Stainless Steel provides better corrosion resistance . . . assures longer service life. Selection of the ELC (extra low carbon) grade is additional insurance against harmful intergranular corrosion. This all adds up to lower maintenance costs, higher profits.

For complete information on Armco ELC Stainless Steels, fill in and mail the coupon for our catalog, "Armco's ELC Stainless Steels."

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A five year statistical report on the C-E Chemical Recovery Unit

Between July 1, 1953, and June 30, 1958—a five-year period—34 C-E Recovery Units have been purchased by these leading pulp and paper manufacturers. They range in size from 80 tons to 667 tons, and average 1,150,000 lbs of dry solids per 24 hours. In total, they represent a pulping capacity of about 13,100 tons.

Name	No. Units	Des. Press.	Steam Temp. °F.	Pounds Dry Solids per 24 Hours
B. C. Forest Products, Ltd.	1	700	550	1,600,000
Canadian Forest Products, Ltd.	1	450	750	500,000
Canadian International Paper Co.	1	300	500	900,000
Chesapeake Corp.*	1	1400	600	1,250,000
Continental Can Co.*	1	975	640	1,120,000
Crossett Paper Mills*	1	1000	700	1,500,000
Dierks Paper Co.	1	675	750	495,000
East Texas Pulp & Paper Co.*	1	700	750	1,600,000
Enso Gutzeit Oy.*	1	1075	900	1,500,000
Enso Gutzeit Oy.*	1	1075	840	1,500,000
Enso Gutzeit Oy.*	1	1400	900	1,500,000
Georgia-Pacific Paper Co.	1	700	750	1,050,000
Halifax Paper Company, Inc.*	1	1000	825	1,500,000
International Paper Co.*	1	1000	825	1,500,000
K. V. P. Co., Ltd.*	1	725	450	1,100,000
Longview Fibre Co.*	1	950	750	2,000,000
MacMillan & Bloedel, Ltd.*	1	690	730	1,020,000
Mead Corp.*	1	1025	850	1,100,000
Nekoosa Edwards Paper Co.*	1	500	700	1,050,000
North Carolina Pulp Company*	1	725	750	1,200,000
Northwestern Pulp & Power, Ltd.	1	700	750	1,400,000
Rayonier, Inc.*	1	700	760	1,400,000
Riegel Paper Co.*	1	700	725	1,050,000
St. Lawrence Corp., Ltd.	1	700	750	1,060,000
St. Mary's Kraft Corp.*	1	700	725	825,000
St. Regis Paper Co.*	2	700	750	1,150,000
Southland Paper Mills, Inc.	1	700	750	525,000
Taiwan Pulp & Paper Co.	1	500	825	286,000
Tecnica Cubana, S.A.	1	500	750	240,000
Thurso Pulp & Paper Co.	1	525	710	675,000
Union Bag-Camp Paper Corp.*	1	500	750	1,610,000
Union Bag-Camp Paper Corp.*	1	500	750	1,610,000
Weyerhaeuser Timber Co.	1	700	750	1,050,000

* Companies which have purchased C-E Recovery Units in addition to those listed here. There are twenty-two such companies on this list. One organization has ordered six C-E units.

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Operations Research and How It Can Be Applied in the Paper Industry

What operations research is. What it can do. How it is being used and could be used in all aspects of our industry from cutting trees to merchandising finished products.

Dr. Harry B. Wolfe

Staff Member, Operations Research Group
Arthur D. Little Inc., Cambridge, Mass.

The paper industry is showing an increasing interest in the use of operations research to help solve corporate problems. Several paper companies have already found practical applications. Others may wonder what operations research can do for them or even what it is. This article presents a brief description of the field of operations research and suggests areas where it can be applied profitably to the paper industry.

Origins in the War

Operations research ("O. R.") as an organized activity was a war baby, by scientific know-how out of military necessity. The British were desperately trying to get the maximum use of their slender resources during World War II and thought that perhaps scientists could help on such problems as: What is the most effective distribution of anti-aircraft defenses? How often should fighter planes be serviced to get maximum fighting time? How can shipping losses be minimized?

The scientists — physicists, chemists, biologists, mathematicians—approached these problems in the manner that they had approached problems in their own fields. Their scientific method involved observation and measurement of the relevant factors in the problem, developing a model, or hypothesis that explained or accounted for the observed facts, testing the model, and modifying it in light of the results of the tests. In response to the problem of shipping losses, for example, British and American scientists made a careful statistical study of losses in convoys. Their observation: ship losses were inversely proportional to the number of escorting vessels but were independent of the number of ships in the convoy. Their recommendation: increase convoy size and escorts per convoy to decrease proportionate loss. Outcome: convoy losses were cut to the point where it became unprofitable for German submarines to attack the convoys.

Industrial Operations Research

Encouraged by their success in studying and improving military operations, the operations researchers began working in 1949 at Arthur D. Little Inc. and later at other consulting organizations on industrial and business problems. What these men brought to industry was a particular method of looking at industrial problems. Certainly there are several mathematical techniques that have been principally associated with operations research. Equally important, however, was the approach that operations are viewed as a whole and the conviction that business and industrial problems can be subjected to the "scientific method"—the same measurement, analysis, and mathematical methods that are characteristic of research in the sciences.

In the postwar years of industrial application, O. R. has enjoyed a success as great as that of its war-time use. It has grown in sophistication and application; by now O. R. has gained a secure place in most industries. One of the most successful industrial applications of O. R. is production planning and inventory control. Other applications range from distribution and transportation to marketing and advertising.

Three examples drawn from the paper industry illustrate the approach, methods, and results typical of operations research. These examples represent cases where O. R. has already been successfully and profitably applied to paper industry problems.

Scheduling a Multi-purpose Machine

A large multi-purpose paper and board machine had been operated as a "job shop," producing only to firm customer orders, because of the variety of products, grades, and roll sizes. Orders were scheduled on the machine as they were received; there was little attempt to carry inventory of any particular sizes in order to lengthen production runs. As a result, runs were short, and grade and product changeovers frequent. The production department would have preferred longer grade runs to reduce changeover costs and minimize trim losses. The sales department, on the other hand, wanted to provide good customer service in a competitive market situation, necessitating short production runs or high inventories. The comptroller wished to keep inventories low to reduce warehousing costs and interest on invested capital. There were, therefore, important conflicting interests among departments of the company.

An O. R. team attacked the problem by first analyzing all the out-of-pocket costs that resulted from the product and grade changeovers, including those for wash-ups, felt and wire changes, and lost time on startup. Since the time re-

quired for changeovers varied, it was necessary to treat these on a statistical basis. The team then used mathematical techniques to analyze the sales data and determine the degree of fluctuations in the monthly sales of particular grades and roll-widths. The effect on trim waste of different scheduling and inventory policies was investigated by simulating on an electronic computer several months' slitting operations under different control policies and calculating the resulting trim waste for each case. In a similar fashion several inventory control and production scheduling models were constructed and tested to determine the best form in which to keep stocks of paper and board. (See Figure 1).

Actual past sales demand was used to compare the inventory levels and customer service that would result from the different reorder and scheduling models. The research team determined with management, suitable interest charges against inventory investment, based on what the company could earn elsewhere.

The team was then able to present for management the total cost—including inventory investment, cost of mill schedule changes, and cost of trim waste — required to achieve any degree of customer service. This put company management in a position to determine a service policy that was realistic in terms of the cost of service. Once this was agreed upon, the team recommended a production cycle - scheduling procedure and inventory control system that resulted in substantial savings in production costs, was consistent with management objectives on customer service, and minimized costs for the company as a whole.

Plant-Warehouse Location and Allocation

A paper container manufacturing company operating a series of converting plants throughout the country distributes its products through more than fifty district warehouses. The warehouses provide good service to local customers and help reduce freight costs by permitting consolidation of plant shipments. One question that periodically faced this company was: Which plants should service which warehouses, in view of freight costs, demand in the warehouse territory, and plant capacity? Since the plants were operating at close to capacity, management also wished to know the effect of installing additional capacity and in which plants the additional machines should be installed?

An operations research team tackled the problem by first making a rough market breakdown, indicating the customer characteristics and amount of

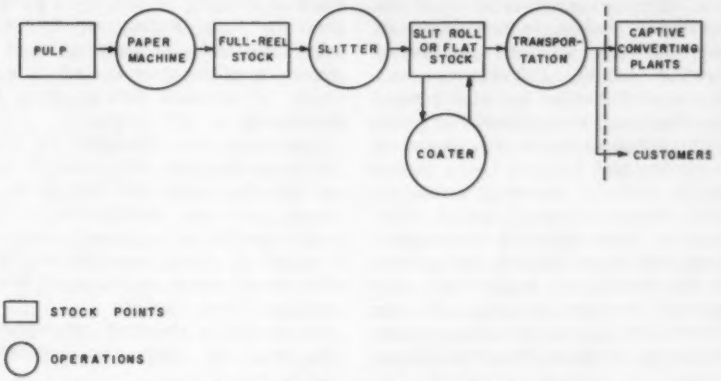

Figure 1—Basic Inventory Systems

Figure 1 represents a schematic model of production operations and possible inventory points for the paper company. Inventories serve to separate and provide flexibility for the various "production" operations, including forming and drying, slitting, coating, and transportation to either the captive converting plants or to other customers.

Several basic inventory systems were considered:

1. Schedule the machine to order, not keeping any buffer inventories.
2. Keep full-reel stock, and slit as orders are received. Under this system the machine and slitter would be scheduled separately.
3. Keep an inventory of slit roll or flat stock, on which the captive plants and customers can order.
4. Have the captive plants carry inventory to last between regular production intervals.

The total inventories and production changeover costs under each of these systems was considered and the best inventory system then chosen for each type of product.

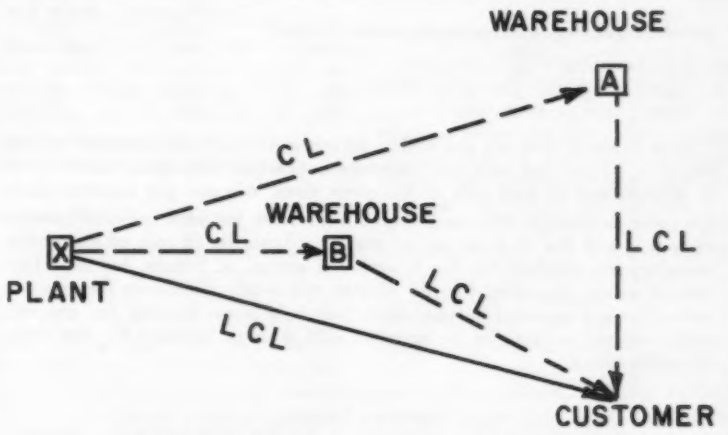

Figure 2—Warehouse Distribution Problems

There are several possible methods of supplying the customer:

1. Ship directly (LCL) from the plant to the customer.
2. To reduce freight cost, ship more economical (CL) shipments from the plant to warehouse B and supply the customer (LCL) out of inventory kept at the warehouse.
3. Consolidate warehouse B into A to reduce total warehouse inventories, and supply the customer from warehouse A.

To determine the optimum distribution pattern for a given level of customer service the following costs must be considered in each case:

1. The total freight cost from plant to customer.
2. The total inventory at the plant, plus inventory in transit, plus the economical order inventory and safety inventory in the warehouses.
3. The extra warehouse and handling costs.

business in the various geographical regions. Employing a variation of the mathematical technique, linear programming, the team was able to develop graphical methods of finding the optimum market division for each plant—that allocation of warehouses to plants which minimized the costs of inventory, production and freight. Using mathematical methods, the team tested the effect of consolidating several warehouses; in many instances consolidation of warehouses permitted lowering overall inventories and freight costs (See Figure 2). For some geographical areas, further savings could be obtained from an analysis of the combined freight and inventory costs of the alternate possibility of shipping to customers directly from the plant. Rules were developed to determine which shipments should go directly from the plant and which items would be serviced directly from the warehouses.

The team then calculated the effect on inventories and production of adding capacity to the different plants. It turned out that considerable savings could result by adding machine capacity to one of the plants: the additional flexibility would result in decreased inventories and better service.

As a result of the study, management was able to reduce the company's freight bill and inventory investment without reducing customer service. In addition, the company staff, which had worked on the project and had become familiar with the techniques, was in a position to adjust and update the warehouse-plant allocation as market conditions changed and adjustments became necessary.

Balancing Trim and Inventory

Management of a corrugated box plant with several corrugators found that, with increasing business, inventories of board were increasing to the point where warehouse handling was becoming difficult and it would soon be mandatory to have additional warehousing space. Because the plant supplied a large number of small customers, it received orders for many different grades and box sizes. Plant management therefore felt it necessary to maintain large inventories of roll stock in many grades and roll-width, in order to achieve a good trim on the corrugators in the face of large fluctuations in roll usage. The clear — and apparent — saving in material costs by using the most economical roll-width for each order had obscured the considerable investment in inventory necessary to achieve the good trim.

In view of the impending decision on whether or not to obtain additional warehousing space, management requested a study to determine the need for this additional space. A joint team of consultants and members of the company's staff was formed to investigate the problem.

The team first obtained several years' history of usage by roll-width. A statistical analysis of the usage indicated that there was some seasonal variation in demand and also that there were large fluctuations in demand for particular roll-widths from month to month. Despite these large fluctuations, the team found that simple mathematical procedures would serve to forecast usage of individual roll-widths over the lead time, or time required to obtain a replenishment order from the paper mill. These procedures made it possible to cut reserve inventories considerably. The extra warehouse space was unnecessary.

The team then investigated the possibility of achieving further inventory reductions by having the scheduler substitute a slightly larger roll-width for the smaller one when the smaller width was out-of-stock (thereby increasing the trim loss). (See Figure 3). Different inventory and roll-width substitution policies were checked by simulating, or trying out on paper, what would have happened to inventory levels and trim loss if the policies had been applied to the actual demand of the past year. The

Figure 3—Trim and Inventory Example

As an example of how to reduce inventory at the expense of a slight increase in trim, consider two roll-widths, 40 inches and 41 inches, which are ordered once a month from the supplying plant. The average monthly usage is 16 rolls for each; because of fluctuations in demand from month to month, however, an extra ten rolls are stocked to protect against having to take a trim loss. The inventory is thus brought up to 26 rolls each month for each roll-width, for a total beginning inventory of 52 rolls (Table I). Under this inventory system, either roll-width should run out less than once every ten years;* trim losses would be negligible.

* We are assuming that sales fluctuations have a statistical distribution with standard deviation equal to square root of average monthly usage.

Table I
Inventory Policy 1

Roll-width	Average Monthly Usage (rolls)	Safety Inventory (rolls)	Total Beginning Inventory (rolls)	Average Annual Trim Loss (roll-inches)
41"	16	10	26	0"
40"	16	10	26	0"
Total	32	20	52	0"

Now suppose that we are willing to use a 41-inch roll whenever we run out of a 40-inch roll, and are therefore concerned only about running out of 40-inch and 41-inch rolls at the same time. We can get approximately the same protection that we enjoyed separately for each roll-width under System I, with the re-order policy shown in Table II: 10 rolls of protection inventory are stocked for the 41-inch roll-widths, as before, but only four rolls of safety inventory for the 40-inch roll width. (Demands for the two roll-widths are assumed independent; that is, a large demand for one roll-width will not necessarily be coupled with a large demand for the other roll-width also.)

Table II
Inventory Policy 2

Roll-width	Average Monthly Usage (rolls)	Safety Inventory (rolls)	Total Beginning Inventory (rolls)	Average Annual Trim Loss (roll-inches)
41"	16	10	26	0"
40"	16	4	20	2"
Total	32	14	46	2"

We have thus reduced the total average inventory by six rolls. However, we expect to run out of the 40-inch roll-width twice a year; in these cases we would use a 41-inch roll. We would therefore incur a trim loss of about two roll-inches a year. If this trim cost is less than the cost of carrying the extra inventory investment of six rolls, policy two will result in net savings over policy one.

If many roll-widths are being considered, the mathematics involved becomes more complicated; the principles however, remain the same.

simulation indicated that further inventory reductions could be obtained, at a slightly increased cost of trim waste. For the company as a whole, these savings in inventory investments more than offset the added trim costs.

The team finally recommended installation of an inventory control and corrugator scheduling system based on simple statistical forecasting techniques that could be used routinely by the production scheduling department. The system was designed to minimize the sum of inventory investment, warehousing cost, and corrugator trim costs. Implementation of the recommendations resulted in a large decrease in inventories, a small increase in trim losses, and over-all savings of 40 per cent in combined inventory and trim costs.

How Operations Research Works

From these examples we can briefly summarize some chief characteristics of O. R.:

• Operations research is practical investigation and solution of business problems in which the investigators employ the same processes of observation and induction and the same reverence for facts that characterize research in science. Typically the analyst moves towards an understanding of the operation under study by trying to develop a mathematical description, or model, of the operation. When this model has been verified by experimentation, it provides a fundamental understanding of the operation that enables the analysts to manipulate various factors, and to make predictions and recommendations for improvement of the system.

Because O.R. *is* research, it is often speculative. Speculation on apparently unrealistic possibilities is sometimes necessary for a complete comprehension of an operation. And as in science generally, major improvements are often obtained only by first obtaining a fundamental grasp of the problem. For these reasons, O.R. work generally takes longer than normal engineering analyses; the problems tackled should be sufficiently important to justify the effort expended.

• The operations researcher attempts to view the relevant company operations as a whole. As indicated in all three examples, considering only one department or factor at a time often may not be consistent with overall company interests; the cost savings were obtained by considering all the various factors that were affected by the alternate policies. In the first example, for instance, it was necessary to consider mill changeover and trim costs, warehousing and inventory costs, and sales department customer service in arriving at a production and inventory system that was consistent with the interests of the entire company.

• The emphasis in O.R. work has been on investigating those operational problems that could be reduced to quantitative factors and measured. In the course of work, O.R. may use a variety of mathematical and experimental techniques, including statistics, calculus, linear programming, and "Monte Carlo" or simulation. An electronic computer is often necessary to perform the complex calculations. These are only high-powered tools, however, that must lead to down-to-earth recommendations to be implemented on a practical and continuing basis.

In this respect, it should be noted that O.R. cannot supplant management's role of making decisions. It *can* provide management with better bases for planning and decision making. In the first example above, the O.R. team was able to develop the cost—to the whole company—of any degree of customer service. By considering the qualitative factors as well, such as competitive service, management was able to arrive at a realistic policy on the suitable levels of customer service.

Opportunities in Paper Industry

For convenience in surveying opportunities for O.R. in the paper industry, we can isolate three general operational areas: Woodland operations, Production operations, and Distribution. In practice, of course, problems frequently involve more than one area.

Woodlands

Although woodlands operations and conditions vary widely from winter cutting with a high proportion of hand labor and severe terrain conditions to highly mechanized operations nearly year-round, most woodland operations, especially those under company control, present a number of common problems that can be tackled by O.R. Where the period of time from cutting the wood to delivery at the mill is considerable, say a year or more, sizeable inventories of wood build up in the woods, the river or other channel of delivery, and at the mill. Analysis of this "production" and inventory problem that takes into account forecasting, weather fluctuations, factors affecting cutting operations, the delivery system, and deterioration in the wood pile may well improve the control system and lower the investment tied up in this raw material.

Corollary to such a study might be research on alternative cutting methods, hauling, and dumping to reduce the time and expense of these operations. This study would also evaluate the benefits of new ideas such as woodlot chipping. The appropriate balance among tractor, trailer truck, and cutting effort, and between pre-hauling and hauling operations could be determined, taking into account the chance fluctutation and congestion problems.

The use of central camps with a well-developed road network for more efficient and flexible woodlands operations in response to shifting mill demand is under consideration by some managements. Operations research can help to determine optimum camp size and location to balance the costs of building and road construction, hauling, and equipment.

Large-scale integration, both horizontal and vertical, is becoming increasingly common in the industry. Not only does this move assist in the complete utilization of the woodlot crop, but the multiplicity of end products—from saw timber, plywood, particle board and hard board, to pulp, paper and paper board—can aid in leveling requirements on the woodlands. O.R. can be used to determine the best division of the raw material among various mills to achieve greatest overall efficiency of operations, in view of the raw materials available for furnish components, their costs and their effect on production costs.

Production Operations

Any one of the above product groups, such as paper and paper board, presents a choice of several possible raw material combinations. For example, in Figure 4 we have illustrated some major material and process alternatives in paper and board manufacture. It is apparent from the chart that mill management is faced with a host of material and process alternatives; this multiplicity of choice is perhaps unique to the paper industry. O.R. can help in the selection of those alternatives which will minimize overall cost. Addition of capacity to an existing mill, for example, depends upon a complex function of raw material and equipment costs, availability and technical suitability, processing costs, product properties, type of market, market location and competition. In most instances a manufacturer will not have all these choices open to him; some of the variables will be fixed, such as mill location—and hence available wood species—or type of paper required to supply a known market.

A typical example of the number of alternatives available is the bookpaper mill that needs to develop higher tensile strength in a paper grade to meet the demands of higher-speed printing

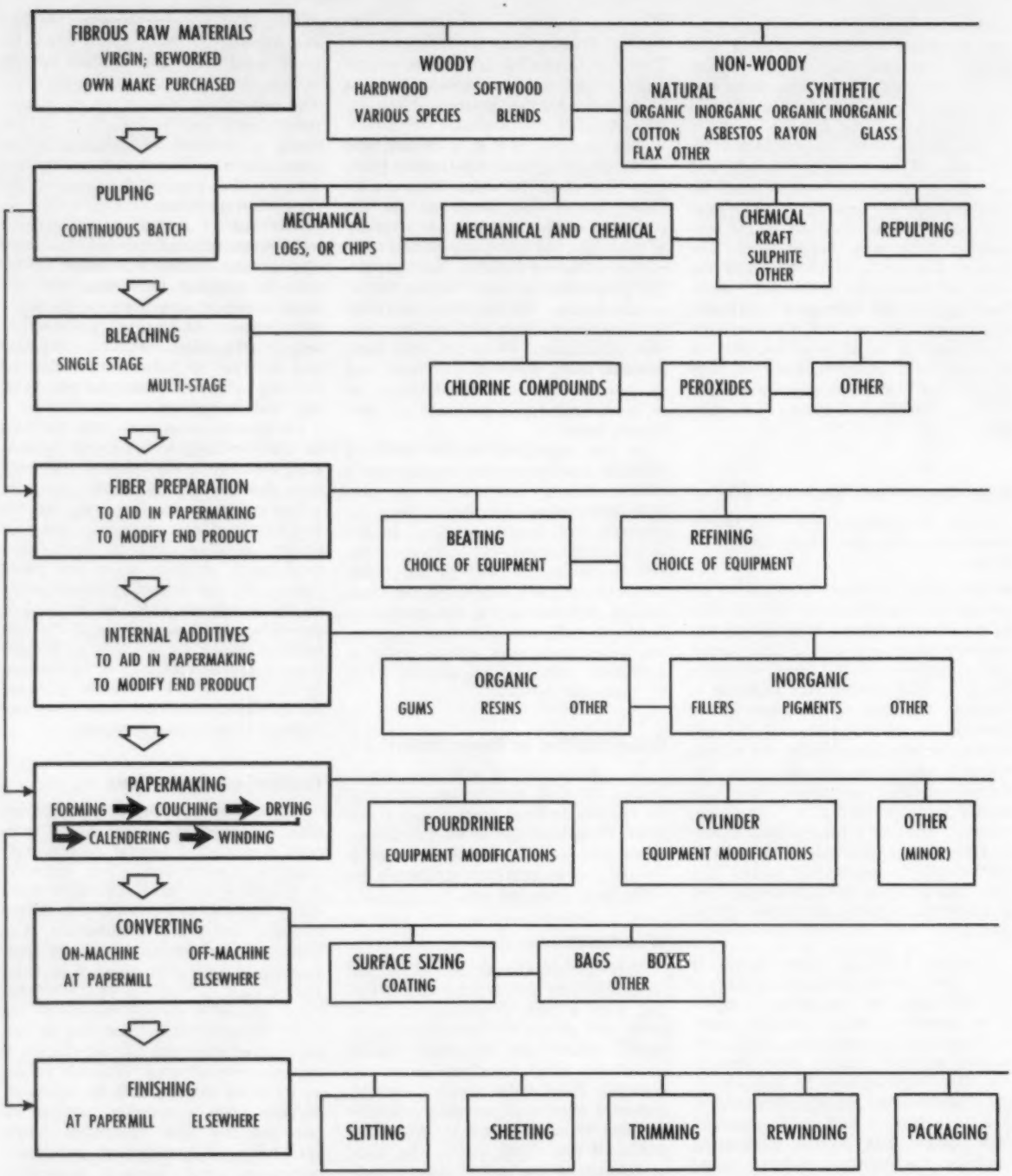

Figure 4—Chart illustrating some major material and process alternatives in paper and board manufacture.

press operation. Should the strength be obtained by increased refining, adding more long fiber to the furnish, using an additive such as carboxy methyl cellulose, or combinations of these possibilities? The various factors to be considered include at least the following:

Increased Refining—cost of additional equipment and power; effect of lower freeness on machine speed and drying, hence cost; effect on opacity and cost of additional fillers; effect on quality, i.e. printability, appearance, stiffness, etc.

More long fiber—added cost of the furnish; effect on formation and sheet quality.

Additives—added cost of the furnish; effect on freeness and associated costs; effect on savealls or pollution load and associated costs; effect on sheet quality.

Once the effect of each of the alternative solutions to the tensile strength problem is known, O.R. techniques can be used to examine all the possible combinations and to determine which specific alternative will be most economical.

As suggested by examples one and three, there are almost limitless oppor-

tunities where scientific inventory planning and production scheduling can improve paper making operations. For another example, O.R. has been successfully applied to multi-machine plants to determine optimum mix of orders and scheduling procedures for most efficient operation of the whole plant. The trim problem is also general throughout the industry and our examples have indicated how O.R. can help in its solution.

Equipment wear, such as corrosion of pulping equipment, has plagued mill management from time to time. Use of O.R. techniques and analytical approaches have aided in understanding and reducing this mill problem. Similar approaches are being used in the study of wear of fourdrinier wires.

Distribution

Distribution of mill products, whether semi-finished goods intended for further processing or finished goods bound for users, involves a number of problems associated with warehousing, inventories, freight costs, and sales effort. As discussed in example two, the optimum geographical distribution of warehouses to minimize warehousing, inventory, and freight costs is a typical operations research problem.

Freight costs are high in the paper industry. In the case of a multi-mill company, linear programming can be used to determine how to assign orders to mills (with limited capacities) in order to minimize the total freight bill. This problem becomes more complicated as one considers the combined freight and trim problem in newsprint scheduling, assigning orders to mills to minimize the total of freight and trim costs. This whole area is a promising one for further operations research; perhaps the new technique, "dynamic programming", will prove useful in it. Certainly the potential cost savings justify further research effort.

An interesting new application of O.R. has been in the field of marketing, especially in measuring the effectiveness of sales and advertising effort. O.R. has been used to determine optimum allocation of salesmen's efforts between holding of old accounts and promoting new ones and to reallocate salesmen to more profitable accounts. In the last few years, it has been used to determine optimum promotional budgets and advertising campaign strategies, with findings that have proved of great interest to advertisers.

Planning a Mill

This survey suggests the variety of problems to which O.R. may contribute in the paper industry. As was pointed out, problems may often cut across the operational areas of woodlands, production, and distribution. A specific situation of this kind of problem is the following: Woodland holdings sufficient to support a substantial paper mill have been acquired. What type and size of mill should be built? Technical information must first be acquired, such as type of paper or board products which can be made from the available wood species, market opportunities and locations for these products, data relative to the site location (i.e. water, labor, utilities, waste disposal, etc.), and data relative to mill process alternatives (i.e. kraft versus sulphite, continuous versus batch, etc.). Cost data must also be obtained for the other variables not dependent upon technical factors, such as freight rates to the various market locations, alternatives for type and location of finishing operations, warehousing, inventory levels required, etc. Using mathematical models, O.R. can then test the alternatives and guide the way to the best choice of type and size of mill to build.

Summary

To summarize, the paper industry is one of the fastest growing industries in North America. With this growth is coming increased competition, a strong movement toward greater integration, and a resultant emphasis on efficiency and profit margins and maximum usage of raw material resources. There are many areas in which operations research can contribute to this effort for greater efficiency and cost reduction. O.R. is not a cure-all for problems in the paper industry; it cannot replace normal engineering studies and skills nor can it supplant management's role of decision-making, which must be based on qualitative as well as quantitative factors. But through the combined application of statistical and mathematical techniques and of the scientific method to study company operations, it does contribute to sound decision making and more efficient and profitable operations.

Acknowledgement

The author is indebted to F. G. Perry of Arthur D. Little Inc. staff, and to T. S. Chambers, 3017 East 78th St., Chicago 49, Ill., for their review and suggestions related to the technology of the paper industry.

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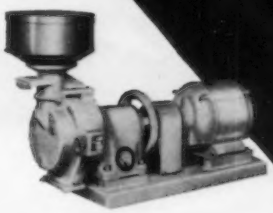

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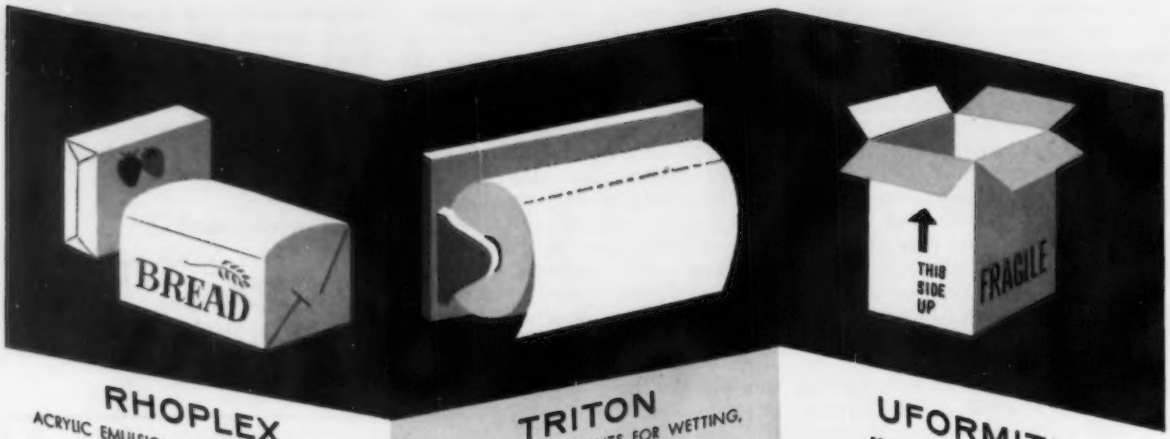

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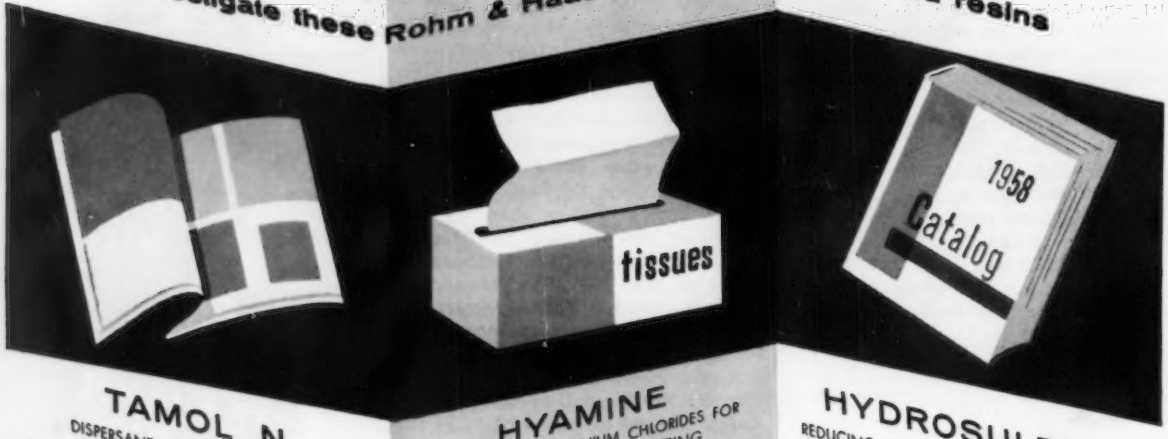

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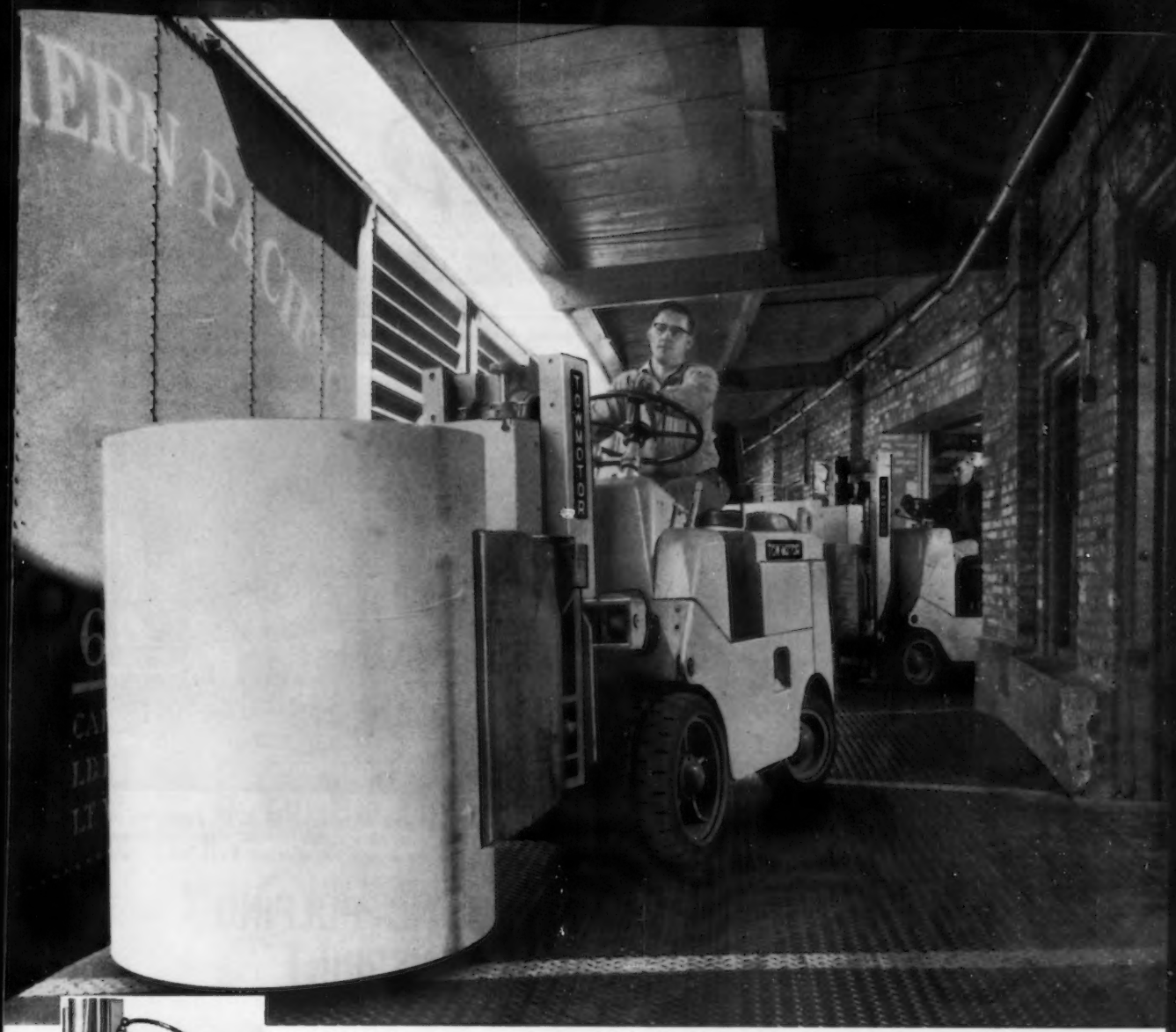

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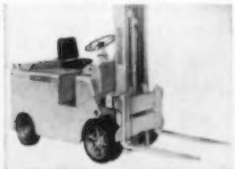

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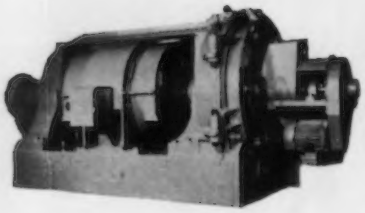


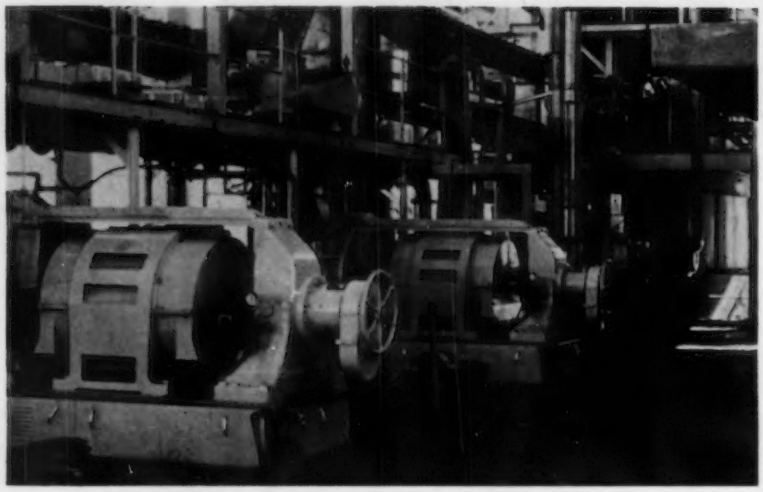
COLD CAUSTIC FOR TISSUES

At the Ninth Congress of the Association Technique de L'Industrie Papetiere held in Strasbourg, France in the spring of 1956, a technical paper was presented describing research studies which indicated the practicability of producing sanitary papers from poplar pulp by means of the cold caustic process.

Just about a year later the first commercial installation was underway at Cartiera Vita Mayer & Company, Milano, Italy. Production of 30 tons per day on a continuous basis was reported.

The logs are debarked, chipped, screened and then brought in contact with the caustic solution. Temperature is maintained at 40°C. Liquor to wood ratio is 16:1 and treatment time is about 10 minutes. Pressing is accomplished in three stages and is followed by refining in precision-built 36-2 single disc "Sprouts."

According to Vita Mayer, the cold caustic process offers them simplified control, continuous production, high yield and low cost. **For the full Vita Mayer story, ask for Better Fibers Report No. 26.**



Three Sprout-Waldron single disc refiners helping to produce 50 A. D. Tons/Day of cold caustic furnish for newsprint. Since this picture was taken, three additional "Sprouts" have been installed . . . capacity is now rated at 80 A. D. Tons/Day.

COLD CAUSTIC PULPING FOR NEWSPRINT

Behind the technical story of successful cold caustic pulping, soon to be revealed by Australian Newsprint, is the superb performance of three 36-2 500 hp "Sprouts." Refining of eucalyptus woods for use in newsprint is being accomplished at 50 hp days per O. D. ton. Consistent yields of 90% are being achieved. The CSF is 150.

Close-up of 36-2 "Sprout" on-stream at Australian Newsprint

Prior to the installation of the Sprout-Waldron cold caustic process, the furnish for newsprint at this Tasmanian mill was 18% bleached kraft (pine), 82% eucalyptus groundwood. Machine speeds were 1080-1200 ft. per minute. With cold caustic refining, the furnish is 18% bleached kraft, 20% cold caustic and 62% groundwood. Machine speeds have increased by 100 ft. per minute and newsprint strength is equal to the world's best.

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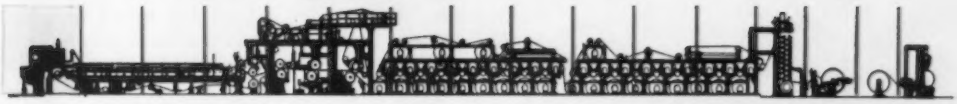

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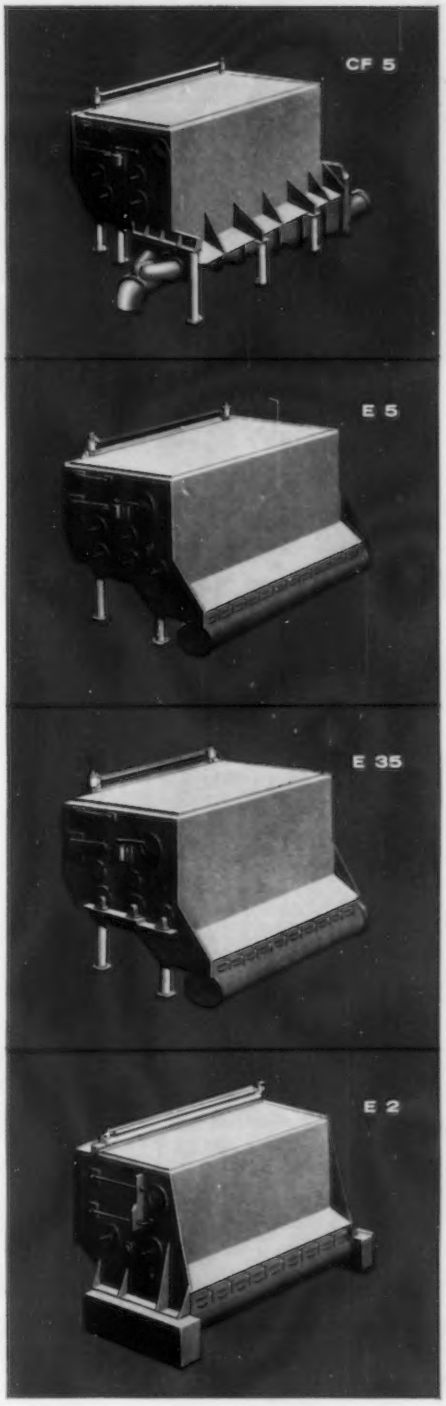

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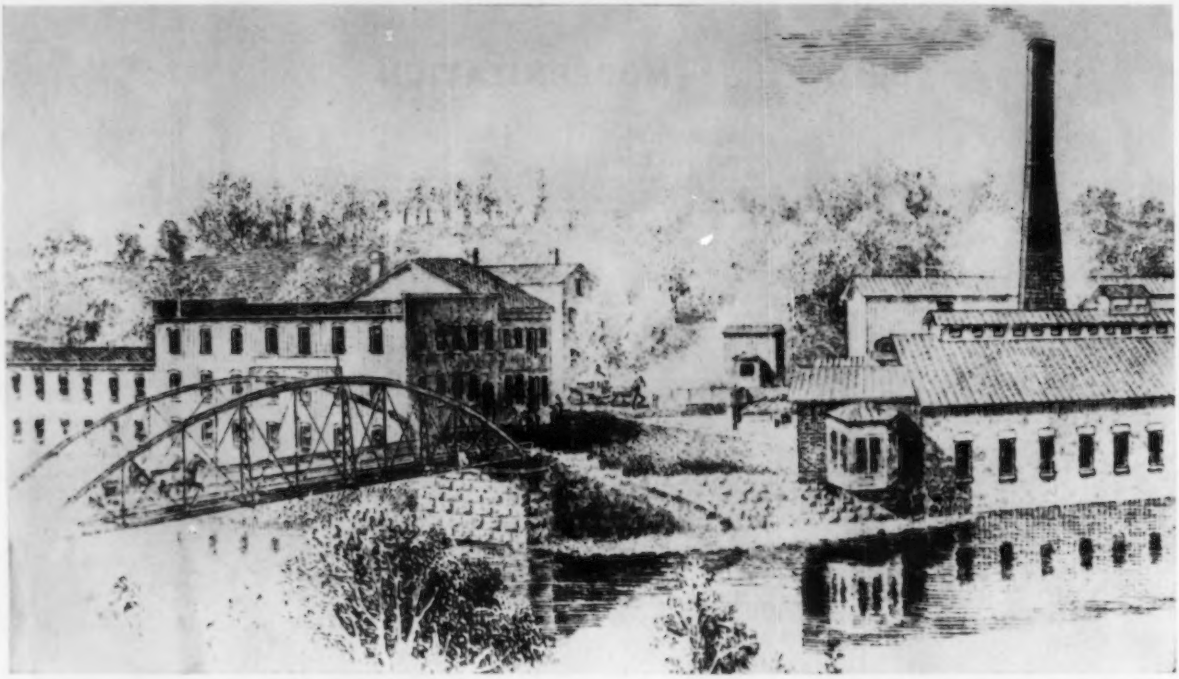


Artist's drawing of Adams Bag Co. in 1858. Chase Bag Co. still retains part of original mill structure.

Historical Chagrin Falls Paper Mill Marks 100th Year

Beginning its second century of operation this year is the Chase Bag Co. paper mill in Chagrin Falls, Ohio. Pictures and a historical sketch released by the company describe growth of the plant since 1858, when the stone mill on the banks of the Chagrin River started making manila rope stock paper, then used for flour bags.

Its output now includes a wide variety of specialty papers, distributed to other Chase factories and to industrial users nation-wide. By choice it limits the quantity of paper it produces, specializing in hard-to-make, high specification kraft for exacting requirements.

Chase itself is 111 years old and a leader in the flexible packaging industry. It operates 13 factories in addition to the paper mill, which was acquired in 1926.

Robert D. Rusch
Manager

Further Modernization

Looking to the future in its centennial year, the mill is modernizing even further its pulp preparation and finishing equipment. This program includes the installation of a Morden Slushmaker and the latest design 72 inch Cameron rewinder. A Black Clawson guillotine roll splitter will be delivered and installed very soon. Storage and shipping facilities are also being enlarged and improved.

Definite and extensive plans are also in process to modify existing fourdrinier equipment so that it will be one of the most versatile and flexible specialty paper machines in the world, according to Robert D. Rusch, manager for Chase at Chagrin Falls. He stated that this would make it possible for the mill and its technical staff to "custom tailor" the finest and most unusual papers desired.

Opening of this year's centennial was marked by a banquet attended by active, associate and retired members of the mill's Quarter Century Club and their guests. Combined service of club members totals over 800 years, according to Mill Manager Rusch. Many are residents of the Chagrin Falls community, where Chase is an important "citizen," not only as a principal taxpayer, but as a large employer and active participant in community affairs.

Mill Origin

The old mill and two dams on the Chagrin River are well known landmarks of the Cleveland area. The original stone mill still stands, attracting a number of artists and interested visitors each year. Surrounding it are the more recent buildings that house the firm's fourdrinier and cylinder machines.

It was in 1841, says the Chase history, that the Chagrin Falls site was first used, for a dam which gave power for operation of a flour mill by means of a water wheel. The next year a second dam was built by Deacon Harvey White who established an axe factory near the dam. In a few years the Lake Erie Paper Co. purchased the stone flour mill on the north side of the Chagrin River and rebuilt it into a paper mill which manufactured newsprint. A considerable amount of its production was sold to the Cleveland *Leader* at that time.

In 1858 Adams and Co., a Cleveland manufacturer of flour bags, bought the paper mill to produce paper for its bags from old manila rope. Adams and Co. is credited with introducing the first paper flour bags, now a standard consumer package. Because Chagrin Falls had no railway facilities at this time, the rope used to make the paper was hauled in wagons from Solon; the finished flour bags then had to be hauled back from Chagrin Falls to Solon to be shipped to Cleveland for printing. The paper mill then produced about four tons of paper per day, all of which went into hand-made flour sacks.

The mill expanded rapidly during the Civil War due to the scarcity of cotton. Paper sacks for flour were used almost exclusively in the North. Just after the turn of the century the Adams firm also started a bag printing operation at the Chagrin Falls mill to consolidate manufacturing operations.

In 1906 the capacity of the mill was increased from four tons to eleven tons per day. New bag machines and additional printing presses were required and the firm, known at this time as the Adams Bag Co., continued successfully to expand its operations.

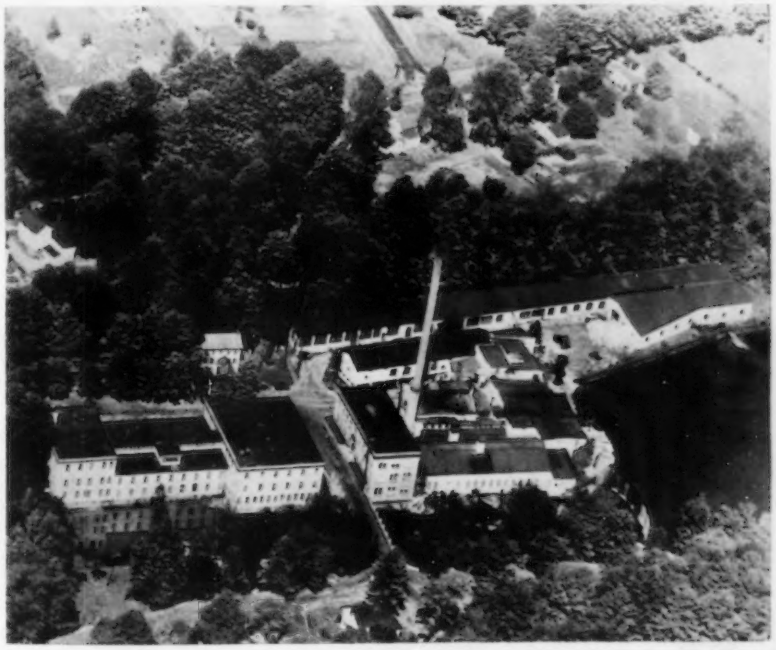
Acquisition by Chase

In 1926 the Adams Bag Co. and its mill were purchased by the Chase Bag Co. of New York as a source of paper for Chase's nation-wide market in the packaging field. E. B. Allen, president and general manager of the Adams Bag Co., became a vice president and director of the Chase Bag Co., serving until his retirement in 1934. K. L. Allen, vice president of the Adams Bag Co., became a member of the board of directors of Chase Bag Co. February 3, 1936, and served until his retirement in 1957. Paper sales are directed by A. C. Clough Jr., whose offices are located in Chagrin Falls, where he is assisted by James Diamond, sales representative.

The Adams Bag Co. in 1923, a couple of years prior to its purchase by the Chase Bag Co.

In 1948 Chase installed a fourdrinier machine to manufacture spinning and multiwall papers. Shortly afterward, the mill began to enter the kraft specialty paper field and pioneered grades of paper for outside sales.

The Chagrin Falls location is now also used by Chase as the headquarters of its general laboratory, a research and testing facility.



Chase Bag Co.'s paper mill at Chagrin Falls today. Part of the original mill still stands, surrounded by more recent buildings that house the firm's fourdrinier and cylinder machines.

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Technical Division
Buckeye Cellulose Corporation

The development of a new and greatly improved cotton fiber pulp has recently been announced by the Buckeye Cellulose Corp. The pulp, which is called Lintabond, is produced from cotton linters. It is manufactured by a new process which chemically alters the cellulose molecule in such a way that substantially improved fiber to fiber bonding is achieved. Papers produced from the treated fiber demonstrate a marked improvement in physical strength.

In recent years the steadily increasing use of synthetic textile fibers has had a serious effect on the available supply of pure cotton rags for use in papermaking. A definite need has rapidly developed for a new source of acceptable fiber for cotton content papers. Cotton linters have been used in increasing amounts, but shortcomings in strength characteristics have limited their utility. Extension of the usage of cotton linter pulp has, therefore, hinged on finding a method to improve its physical properties to a level that is truly comparable to rag fiber. The improved strength of Lintabond substantially overcomes this deficiency and makes the replacement of rags possible in a wide range of cotton content applications.

Two New Grades

Buckeye is currently introducing the Lintabond pulp in two grades. The stronger pulp, designated CF-1, can be used as the sole furnish in 100 per cent cotton content papers. A more economical grade, CF-5, was developed primarily for use in blended papers and in applications where the highest order of strength is not essential. The two grades are similar except for strength development. Both are high brightness pulps produced to rigid specifications to assure uniformity of performance.

The Lintabond pulps have been extensively evaluated both in the laboratory and in mill trials. In all evaluation work, the new pulps were compared with an unbleached muslin stock which was chosen as representative of the best rag fiber available. Table I shows the results of beater tests of the two Linta-

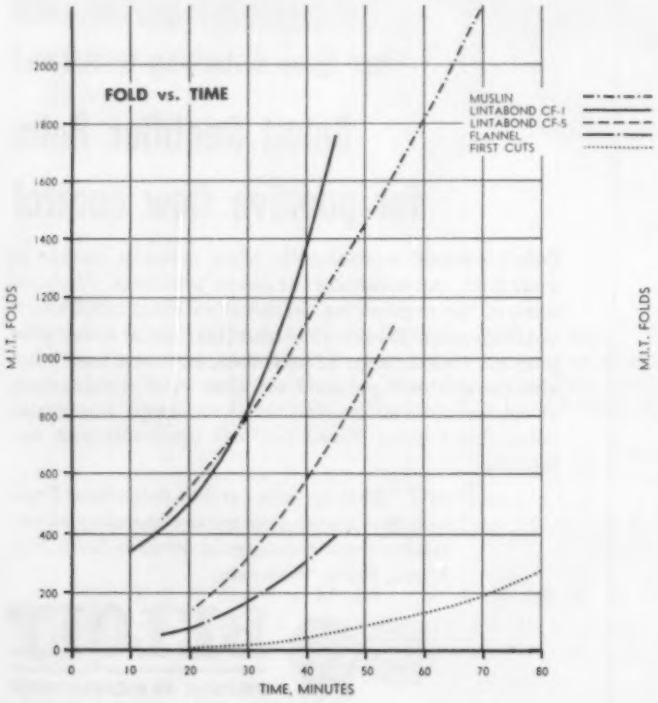

Figure 1

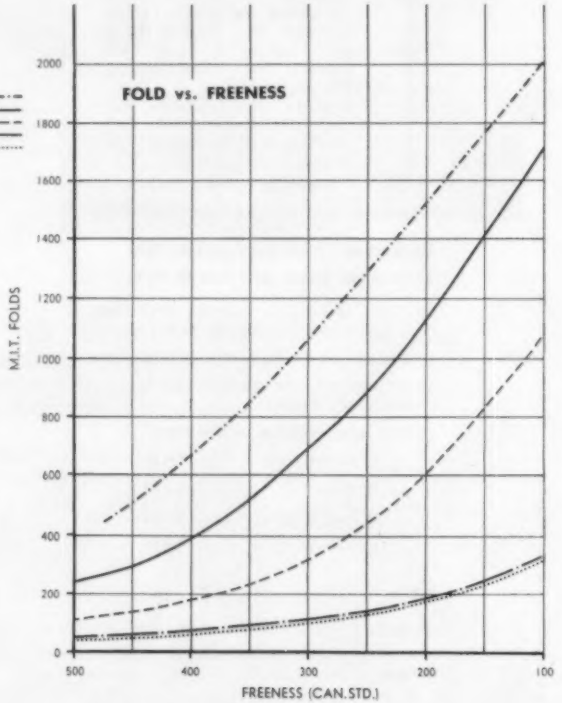

Figure 2

bond pulps, muslin, a flannel ragstock, and standard first cut cotton linter pulp. The flannel is included to represent the characteristics of rags that are suitable for use in applications where extremely high strengths are not required. The first cut data is typical of the strongest type of cotton linters when prepared by conventional processing. All results are on 20 pounds (17 by 22 inch-500) air dried handsheets. The pulps were each prepared in a 5 pound Noble and Wood beater. Results are given at two freeness levels.

TABLE I

200 Can. Std. Freeness*	Mullen	M.I.T. Fold	Tensile	Tear
Muslin	46	1520	27.5	180
CF-1	50	1130	26.5	114
CF-5	45	580	23.5	94
Flannel	40	180	23.0	115
First Cut Linters	35	190	21.5	120
100 Can. Std. Freeness*				
Muslin	50	2020	30.0	153
CF-1	55	1700	29.0	108
CF-5	52	1100	26.0	87
Flannel	44	360	26.0	100
First Cut Linters	37	320	23.0	105

*200 C.S.F. = 485 S.R.
100 C.S.F. = 320 S.R.

Notable Strength Improvement

The data demonstrates the very notable improvement that has been effected by the new pulping process. Both CF-1 and CF-5 are substantially superior to the flannel and first cut pulp. CF-1 has a bursting strength nearly 50 per cent higher than that of the standard linters and even exceeds the muslin in this respect. Fold is an important specification in many cotton content papers and the endurance of CF-1 is over five times that of first cuts. In general the CF-1 pulp possesses strength properties which are sufficiently close to even top quality muslin to make possible the direct replacement of rags in 100 per cent cotton content papers.

A more complete comparison of the various pulps is presented in the beater curves in Figures 1 through 4. These graphs show the development of folding endurance and bursting strength with respect to both freeness and beating time. A comparison of the time and freeness curves is particularly interesting. The comparative results given in Table I are at equal freeness. Of far greater importance to many papermakers is the strength level that can be obtained in a given beating time. Figures 1 and 3 reveal that the Lintabond pulps develop strength in the beater very rapidly and that at equal beating time they compare even more favorably with rag stock. This is particularly important since Lintabond pulps have faster drainage than their freeness would indicate. They will perform satisfactorily on the paper machine at freeness levels well below those normally used for rag stock. The papermaker can use this combination of rapid beating and free draining characteristics to good advantage in producing stronger papers.

Evaluation of Blends

Further testing of the Lintabond pulps included their evaluation in blends with both rag stock and wood pulp. This work showed that the pulps were quite suitable for blending and no unusual effects or problems were encountered. The work also demonstrated that blends could be developed in which the particular characteristics of the various

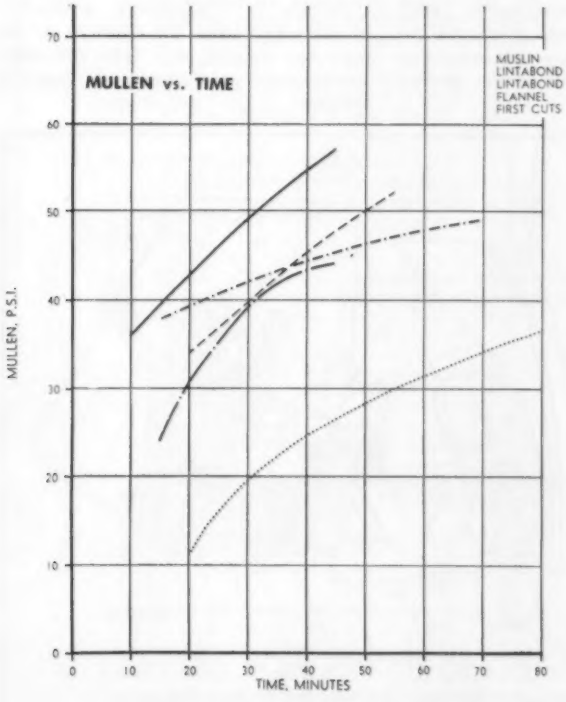

Figure 3

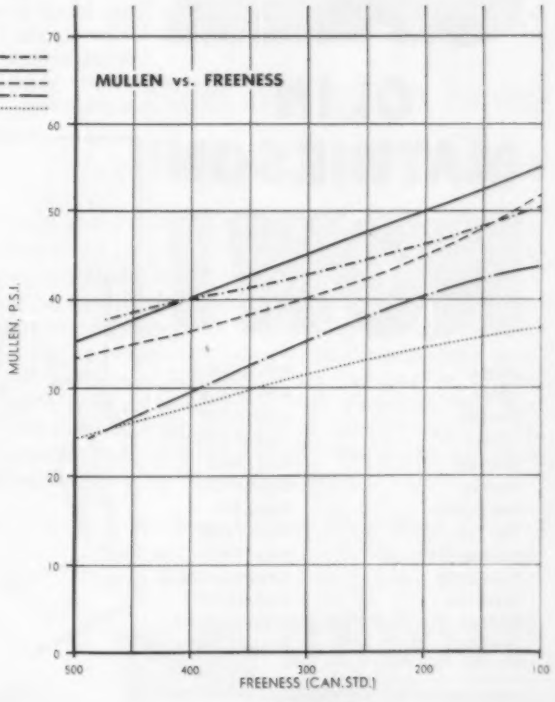

Figure 4

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methanol

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Providence	GAspee 1-2070
St. Louis	VOlunteer 3-5300
Montreal	REgent 1-2771

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fibers would complement each other and produce papers having a variety of properties. For instance in 100 per cent cotton content paper the inclusion of CF-1 improved the bursting strength of even a top quality muslin. In a similar way the muslin improved the tearing resistance of the blend. The uniformity of Lintabond pulps should also prove to be very useful to papermakers in overcoming any variations in rag quality.

The laboratory evaluations of Lintabond have been verified by mill trials in which both CF-1 and CF-5 were processed into 100 per cent cotton content paper under normal mill conditions. Both air dried and machine finished papers were produced. The trials demonstrated the satisfactory behavior of Lintabond pulps in commercial equipment. They also confirmed the laboratory strength comparisons and rapid beating characteristics previously reported.

Summary

In summary, the particular process of chemical modification employed in the manufacture of Lintabond has resulted in paper strength properties vastly superior to previously produced cotton linter pulps. The treatment has also reduced refining power and time requirements. The pulps continue to possess the characteristics of uniformity, high brightness, and good formation previously associated with cotton linter pulps. The dependability of supply of this new source of strong cotton fiber will be of prime importance to papermakers. The CF-1 pulp is suitable for the manufacture of 100 per cent cotton content papers as well as for blended applications.

Complete data on the evaluation of these new pulps has been published in a report which includes samples of the commercially manufactured papers. Copies are available from the Buckeye Cellulose Corp., Memphis 8, Tennessee.

NEWS OF MERCHANTS

Blake, Moffitt Appoint San Francisco Manager

Blake, Moffitt & Towne, pioneer Pacific Coast paper distributing organization, has appointed E. Dixon Heise its San Francisco regional division manager.

Mr. Heise, who advances from Oakland division manager, will have general supervision over the company's divisions at San Francisco, Oakland, San Jose, Sacramento, Stockton, Fresno and Reno, and its district warehouses at Santa Rosa, Salinas and Bakersfield. He succeeds James A. Gruner, who is planning to retire at the end of 1959.

Alling & Cory Utica Becomes Syracuse Branch

The Utica office and warehouse of the Alling and Cory Co. will become a branch of the Syracuse division as of October 1, according to Clifford L. Van Derbogart, president. Utica has been operated as a branch of the Rochester division since its origin in 1945.

George W. Litzenberger, a director of the corporation and manager of the Syracuse division, will head the combined operation. Royston F. Spring is manager of the Utica branch.

"Gentlemen...gentlemen...It's only fair to hear the operator's side...before we fire him!"

HANDMADE PAPERS OF JAPAN

THE HANDMADE PAPERS OF JAPAN by Thomas Keith Tindale and Harriett Ramsay Tindale. This study, which is the result of several years of research in Japan, is one of the most ambitious works on the subject of papermaking which has ever been attempted. Here is a work, indeed, which is not only a distinguished history of this unique craft, but a veritable museum of paperiana—a collection which contains: actual samples of fabulous old and rare papers, a volume of magnificent contemporary papers, and a portfolio of exquisite watermarks. We believe that these particular features, which necessarily limit the size of the edition, can never be rivaled.

Vol. I. The Handmade Papers of Japan.
Introduction by Dard Hunter and Bibliographical Guide for Students of Japanese Hand Made Papers by Bunsho Jugaku. *Complete history and description of papermaking in Japan,* supplemented with botanical drawings, and a series of 32 full-page photographs by the distinguished photographer, Francis Haar. The text also includes *facsimile hand-colored reproduction, with translation, of the oldest Japanese illustrated work on papermaking — the KAMISUKI TAIGAI,* which was done in 1784.

Vol. II. The Seki Collection.
Portrait and biography of Mr. Seki, with 187 actual mounted specimens of paper from his collection. These samples range in date from the Nara Period (710-793) to the present day. Each sample, which has been carefully authenticated, bears a complete description about its general type and method of manufacture.

Vol. III. The Contemporary Collection.
A volume of whole-page samples of 139 different papers from 18 Perfectures and the city of Kyoto—a representative cross section of handmade papers now being produced in the various districts under present-day conditions. The name, materials, place of manufacture, and use of each paper is given.

Vol. IV. The Watermark Collection.
A portfolio of 20 of the most modern Japanese watermarks made in the mills of the Government Printing Agency at Oji and Saidaiji. The process of hand rubbing by which these transparencies are made is described in Volume I. These exquisite samples contain elaborate landscapes and seascapes, Noh drama masks, flowers, fruit, Japanese women in native costumes and other characteristic designs. The watermarks, which have been laid in loose so they may be easily examined and exhibited, are done on specially-made colored papers. They are accompanied with a two-page introduction and a three-page descriptive catalogue.

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L. S. Pearson
Southworth Mach.

P. B. Smith
Bailey Meter

Southworth Machine Co., Portland, Maine, announces that Leslie S. Pearson, formerly industrial engineer of S. D. Warren Co., has joined its staff in the capacity of manager—Paper Mill Division.

Mr. Pearson will be responsible for sales promotion, product improvement and new product development for the paper industry.

Bailey Meter Co. has appointed Paul B. Smith a resident engineer in Portland, Oregon, subdivision of the company's Seattle district. Smith's headquarters are at 825 N.E. 131st Place, Portland 30, Oregon.

S. Morgan Smith Co., York, Pa., has appointed two new sales representatives. Process Instruments Systems, Ltd., of Toronto, Ontario, will represent S. Morgan Smith in the province of Ontario; Thompson Equipment Co. of New Orleans, La., will represent S. Morgan Smith in the Mobile, Ala.; Pensacola, Fla. and New Orleans areas.

Torrington Co. has re-assigned these district engineers: E. G. Rowlett, district engineer in Davenport, Iowa, for the past six years, has been assigned to the Los Angeles office as manager. Mr. Rowlett replaces J. H. Williams, who became assistant to the sales manager of the Bantam Bearing Division, South Bend, Ind.

John Heyvaert has been promoted from the Milwaukee office to replace Mr. Rowlett as district engineer in Davenport.

Ron Peterson and Norman Cook, having completed their extensive plant training program, have been assigned to the Milwaukee and Pittsburgh office respectively.

J. C. Richards

F. H. Singletary

B. F. Goodrich Industrial Products Co. has named James C. Richards, Jr., vice president-sales. He has been vice president-sales, B. F. Goodrich Chemical Co.

In his new capacity he succeeds R. V. Yohe, elected president and chief executive officer of B. F. Goodrich Canada.

Eastwood Nealley Corp. has appointed Frank H. Singletary to serve as a sales representative in the southern territory. He will serve with Albert Hardaker, who is already established in the area. Mr. Singletary succeeds Vernon Knight.

Stein Hall & Co., Inc. has appointed John R. Lindquist as assistant to the manager, paper & corrugating department.

Mr. Lindquist's previous assignment was as salesman in the Chicago branch sales office. His new assignment will transfer him to the company's executive offices in New York City.

Charles A. Hodgdon, new member of Stein Hall & Co., Inc., has been assigned to the Chicago Branch Sales Office.

Wallace M. Larlee of the Detroit branch sales office has been given expanded assignments and will now represent Stein Hall in the paper industry throughout the entire state of Ohio.

Western Gear Corp.'s Industrial Products Div. has moved from this locality to be headquartered in the future at the Belmont plant of the company. This plant is located near San Francisco and has the mailing address P. O. Box 126, Belmont, Calif. Ed Jenks, who formerly managed the Dallas office, has become marketing manager of the division.

TIME TO SCRAPE HULLS-

IF any barnacles of obsolete or inadequate productive facilities are left in your plant, the time has come to drydock your ship of business.

The tide is flowing in, definitely, if perhaps, slowly.

Competition is afloat, but the prize and the profit go to those who sail swiftest—those with smooth hulls and spread sails.

Time to scrape hulls.

THIS MESSAGE WHICH FIRST APPEARED A QUARTER CENTURY AGO IS AS PERTINENT TODAY—FOR IT IS AGAIN A GOOD TIME TO SCRAPE THE HULLS OF YOUR SHIP OF BUSINESS.

J. E. SIRRINE COMPANY • Greenville, South Carolina

Engineers Since 1902 A DEPARTMENTALIZED ENGINEERING ORGANIZATION SERVING • BUSINESS • COMMERCE • INDUSTRY

Black-Clawson Co.'s director of research and development, Joe Baxter Jr. (left) receives a 30-year pin from Administrative Vice President Robert F. Vokes who congratulated him for his major contribution to the expansion of the Black-Clawson line at a recent ceremony in Middletown, Ohio.

As director of research and development for the entire company, Mr. Baxter is responsible for the coordinated research program for pulp and papermaking processes and machinery. He has originated many improvements and new applications for existing Black-Clawson equipment, as well as the designs for wholly new types of equipment. He holds more than 20 patents in the fields of pulping, paper stock preparation, papermaking, and paper converting.

Oakite Products Inc. has named Eustace Lingle vice president in charge of industrial sales and education. Mr. Lingle joined Oakite in 1929. After serving in several positions in the sales department, he was elected to the board of directors in 1939, and named vice president in 1953.

Van de Roovaart

N. V. Chehak

Link-Belt Speeder Corp. has promoted two men to new sales managerial positions. N. V. (Norb) Chehak has been named sales manager in charge of all domestic and Canadian sales for the firm's line of crawler and rubber-tired shovel-cranes and the related diesel pile hammer equipment. D. F. (Dave) Van de Roovaart assumes the duties of assistant sales manager for U. S. and Canadian territories.

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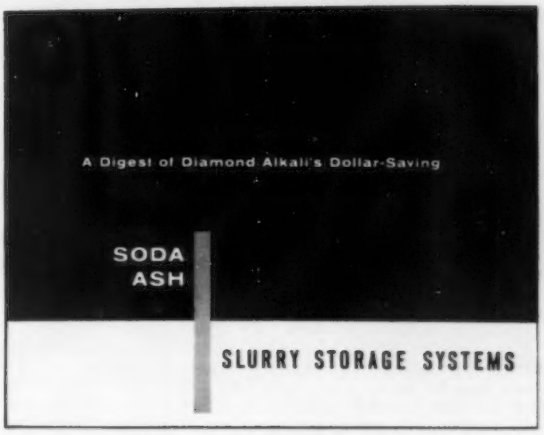

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Bleached Gw'd	$97.50/100.00	$97.50/100.00			
Kraft, Blchd.	157.00/ —	160.00/162.50	‡157.00/162.50*		‡157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		‡137.00/ —		
Kraft, Semi-bleached	140.00/ —	140.00/ —			
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd. ...	155.00/ —	155.00/ —	*155.00/ —	*155.00/ —	155.00/ —
Sulphite, Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd.	135.00/ —	135.00/ —	†135.00/ —	*130.00/ —	
Sulphite, Unb'l. Gl'sn		134.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

‡ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

NEW YORK RAG MARKET

PRICES NOMINAL

New Domestic Cotton Cuttings

Delivered Mill Basis

	Per 100 lbs.
No. 1 White Shirts	$13.50/$14.50
No. 1 Unblchd. Muslins	16.00/ 17.00
Blchd. & Unblchd. Underwears	15.00/ 16.00
No. 1 Light Cream Silesias	12.00/ 13.00
No. 1 Light Blue Overalls	7.00/ 8.00
Percales	6.00/ 6.50
No. 1 Light Prints	5.00/ 5.50
Suntan Khakis	5.75/ 6.75
Cottonades	3.00/ 3.50
No. 1 Washables	2.50/ 3.25

Old Domestic Cotton Rags

Delivered Mill Basis

	Per 100 lbs.
Mixed White	$3.25/$3.75
Cotton Pants & Overalls	2.25/ 2.75
Twos and Blues, Repacked	2.00/ 2.50
No. 2 Roofing	.65/ .80

COTTON LINTERS

Memphis Market

f.o.b. Oilmills

Week Ended Sept. 12		Per 100 lbs.
Grade 1	n. a.	
2		
3		$8.50/ $7.25
4		6.75/ 6.25
5	1 cut—felting	5.75/ 5.25
6		4.75/ 4.25
7		4.00/ 3.50

* Based on 73% cellulose.

OLD ROPE & BAGGING

(Prices to Dealers, f.o.b. N.Y.)

	Per 100 lbs.
New Burlap Cuts	$4.50/$5.50
Scrap Burlap	3.50/ 4.25
Australian Wool Pouches	5.00/ 5.50
Gunny	4.50/ 5.00
No. 1 Domestic Manila Rope	6.25/ 7.50
No. 1 Foreign Manila Rope	5.25/ 6.25
Domestic Sisal Strings	4.00/ 4.50

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	Sept. 15	Sept. 15	Sept. 15	Sept. 15
No. 1 Mixed Paper	$12.00/ 13.00	10.00/ 12.00	9.00/ —	14.00/ —
No. 1 News	18.00/ 19.00	17.00/ 18.00	18.00/ —	15.00/ —
Overissue News (Lg. size)	15.00/ 18.00	16.00/ 18.00	23.00/ —	19.00/ —
Mill Wrappers	13.00/ 15.00	10.00/ 12.00	10.00/ —	14.00/ —
Old Corrugated Containers	26.00/ 27.00	25.50/ 26.00	25.00/ —	25.00/ —
Super Resorted Kraft Paper ...	35.00/ 40.00	35.00/ 40.00	40.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts	37.50/ 40.00	40.00/ 42.50	42.50/ —	30.00/ 35.00
(Semi-chem. medium)	45.00/ 50.00	45.00/ 50.00	45.00/ 50.00	35.00/
New 100% Kraft Corr. Cuts ...	50.00/ 55.00	50.00/ 55.00	57.50/ —	45.00/ —
New Br. Kraft, Env. Cuts	65.00/ 70.00	70.00/ 75.00	52.50/ —	50.00/ 55.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	52.50/ —	55.00/ 60.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	62.50/ —	55.00/ 60.00
No. 1 Groundwood Shvs.	25.00/ 30.00	22.50/ 27.50	18.00/ —	30.00/ 35.00
White Newsblanks	50.00/ 55.00	47.50/ 52.50	35.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	60.00/ 65.00	55.00/ —	— / —
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	65.00/ —	— / —
Hd. White Shvs.	90.00/ 95.00	95.00/105.00	85.00/ —	85.00/ 90.00
Hd. White Env. Cuts	105.00/110.00	110.00/115.00	90.00/ —	100.00/110.00
Col. Tab. Cards	50.00/ 55.00	55.00/ 60.00	52.50/ —	27.50/ —
Manila Tab. Cards	75.00/ 80.00	72.50/ 80.00	70.00/ —	65.00/ —
No. 1 Col. Ledger	30.00/ 32.50	30.00/ 35.00	40.00/ —	22.00/ —
White Ledger	55.00/ 60.00	50 00/ 57.50	55.00/ —	50.00/ —
Mixed Book & Mag.†	18.00/ 20.00	15.00/ 18.00	12.00/ —	— / —
No. 1 Books‡	22.00/ 25.00	22.00/ 27.00	27.50/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

PRICES OF MATERIALS

Aluminum sulphate:		
grd. coml. bulk, c.l. wks.	..cwt.	$2.00 / —
grd. iron-free, c.l. wks.	...cwt.	3.55 / —
Casein, acid prec.:		
dom. sh. pt. c.l., (30 mesh)	cwt.	56.00 / —
Arg. ex dock	.....cwt.	19.00 /19.50
New Zealand	.....cwt.	24.00 /25.00
Caustic soda:		
c.l. wks. solid, 76%	.....cwt.	4.80 / —
flak. & grd. drums, c.l.	....cwt.	5.20 / —
liquid 50% tanks	....	2.90 / —
liquid 73% tanks	....	3.00 / —
China Clay		
dom., dry-grd., airfloat:		
325 mesh bgs., c.l. Geo.	ton	10.00 /12.00
300 mesh, bgs., c.l. Geo.	ton	13.50 /14.50
imp., white, lump, c.l. ex. dock		20.00 /35.00
Chlorine:		
single-unit tanks, works	..cwt.	3.15 / —
multiple unit, 2-5 cars per yr.		5.75 / 4.05
Lime:		
hydrated, bulk, c.l. works	..ton	17.25 / —
quicklime, bulk, c.l. works	ton	14.25 / —
Gum rosin:		
K, M, N, drums, c.l. Savan,	cwt.	7.75 / 7.90
Rosin size:		
70%, gum & pale paste, tank		
cars, south, sh. pt.	.....cwt.	7.51 / —
Saltcake:		
dom. bulk, 100% anh. wks.	ton	28.00 / —
Soda ash:		
light, 58% ash bags, wks.	cwt.	1.85 / —
bulk, c.l. wks.	..... cwt.	1.55 / —
Sodium chlorate:		
drums, c.l., wks.	.....cwt.	9.00 / —
drums, l.c.l., wks.	.....cwt.	9.50 /10.50
Sodium peroxide:		
dms., c.l. E. of Miss.	.....lb.	.20½/ —
l.c.l. (same basis)	.....	.21 / .21½
Sodium silicate, 40° Be.:		
tank-cars, wks.	.....cwt.	1.20 / —
drums, c.l. wks.	.....cwt.	1.55 / —
47° Be. WW.		
tank-cars, c.l. wks.	.....cwt.	1.90 / —
drums, c.l. wks.	.....cwt.	2.25 / —
Soybean, protein:		
chem. isol., wks. c.l. bags	..lb.	.19 / .23
Starches:		
Corn, multiwalls, c.l. prod. plant:		
pearl	.....cwt.	6.49 / 6.75
white, dextrins	.....cwt.	8.08 / 8.20
chlorinated	.....cwt.	8.25 / 8.35
potato, Idaho, c.l. wks.	cwt.	6.35 / —
East, fr. all. 50 cents cwt.		
potato, Maine, c.l. wks.	cwt.	6.50 / —
Sulphuric acid:		
60° Be. cbys. c.l. wks.	....cwt.	2.00 / —
l.c.l. wks.	.....cwt.	2.30 / —
tank-cars, wks.	.....ton	18.60 / —
Sulphur:		
crude, c.l. mines, contract,	long ton	23.50 / —
f.o.b. vessels Gulf dock	...ton	25.00 / —
Sulphur dioxide:		
liquid, coml. cyl., wks.	...lb.	.10 / .12
multi-unit cars, wks.	.....lb.	.0535/ —
Talc, fibrous grd., bags:		
c.l. wks., N.Y.	.....ton	28.00 / —
l.c.l. wks., N.Y.	.....ton	31.00 /36.00
Titanium dioxide:		
anstase, c.l. dlvd. E. bags	..lb.	.25½/ —
l.c.l. dlvd.	.....lb.	.26½/ —
rutile, c.l. dlvd.	.....lb.	.27½/ —
l.c.l. dlvd.	.....lb.	.28½/ —

One of Boston's Biggest...

The hub of their waxing operation is Cities Service!

Starting with a two-man operation in 1920, Hub Folding Box Company has grown into one of Boston's biggest paper convertors, processing 50 tons of paperboard daily.

Today, Hub is a leading supplier of boxes for toys, textiles, hardware and cosmetics—and one of its biggest jobs is supplying Boston's huge frozen fish industry.

Therein lies a big job for Cities Service Pacemaker Wax, too. Fish boxes must remain frozen for days, weeks, even months and often receive much handling—so the wax that coats them must be more than merely adequate. Cities Service Pacemaker Wax fills the bill perfectly.

Says Hub's Treasurer, Mr. Libertine: "We especially like the pliability of Pacemaker Wax and its exceptional non-cracking characteristics. When you're dealing with frozen food packaging, these are the two most important advantages a wax can deliver."

Mr. Libertine joins the growing number of paper convertors who are united in their praise for Cities Service Pacemaker Wax. Whether you're looking for high gloss and gloss retention, outstanding scuff resistance, local warehousing—or simply a savings in the amount of wax needed for proper coating—Cities Service Pacemaker Wax is the answer.

Talk with a Cities Service Wax Specialist. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

Fish will stay fresh for months, frozen and sealed in a Hub Folding Box protected by Cities Service Pacemaker Wax. Hub praises the wax's pliability and non-cracking characteristics.

Local warehousing and convenient packaging are two additional advantages which make Cities Service Pacemaker Wax popular with many users.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

NEW LITERATURE

Air Moving Equipment Data File

Contains engineering data sheets and stock lists of all types of rebuilt and new air moving equipment. Wm. W. Meyer & Sons, Inc., 8311 Niles Center Rd., Skokie, Ill.

Differential Pressure Transmitter Model 10B1463a

Lists materials of construction, design features and performance data. Specification Sheet 10B1463. Fischer & Porter Co., 765 Jacksonville Rd., Hatboro, Pa.

Continuous Chlorine Drying

Describes how Hooker Electrochemical Co., employs a Milton Roy model LMD-31-74 controlled volume pump in their two stage continuous drying system. Also includes a flow diagram and ordering information. Data Sheet A-58-1. Milton Roy Co., 1300 E. Mermaid Lane, Philadelphia 18, Pa.

ET-1 Electronic Tachometer

Contains description of this tachometer, operational information and specifications. Southwestern Industrial Electronics Co., 2831 S. Post Oak Rd., Houston, Tex.

Inductrol Voltage Regulators

Describes the functions and operational concepts of these regulators. GEC-1450 General Electric Co., One River Rd., Schenectady, N. Y.

Micro-Lok Pipe Insulation

Gives physical properties, thermal conductivity, various types factory applied jackets, guide to specifications for application and finishing, and dimensions. Form WPN-2. L.O.F. Glass Fibers Co., 1810 Madison Ave., Toledo 1, Ohio.

Practical Pneumatic Conveyor Design

Gives background information on how to select, operate and maintain pneumatic systems for transporting dry bulk materials. Also provides graphs and technical data. Sprout Waldron & Co., 130 Logan St., Muncy, Pa.

Graver "SSS" Deaerating Heater

Contains complete information on this two-stage spray-type packaged heater which comes complete with internal vent condenser of stainless steel and all controls and valves. Bulletin WC-118A. Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.

Bypass Rotameters

Describes their line of Bypass Rotameters for measuring fluid rate of flow in pipelines two inches in diameter and larger. These are applicable to both liquids and gases. Bulletin 18B. Schutte & Koerting Co., Cornwells Heights, Bucks Co., Pa.

"Antitrust Policies: American Experience in Twenty Industries," a two-volume study by Simon N. Whitney, devotes a 55-page chapter to the pulp and paper industry, in which he discovers only a moderate degree of concentration.

The section on paper first discusses the industry, its firms and products, and then details antitrust cases: early combinations 1900-18; Pacific State Paper Trade case; suits growing out of NRA; suits from 1946 to 1955; Canada and the newsprint industry, and industry opinions on antitrust laws.

"In recent decades promoters have no longer had hope—either practically or legally—of obtaining a monopoly in any branch of the paper industry. Modern consolidations are usually designed to round out a corporation's position horizontally by acquiring a broader product range or wider markets, vertically by getting an assured supply of timber or pulp or an assured market, or geographically," the author points out.

In discussing competitive status in the industry, he reviews the trend of concentrations; mergers, integration, diversification; small and large companies, entry; interlocking directorates, trade associations; pulp and paper economics, competition, newsprint prices; zone pricing; inter-industry competition, and industry performance.

The section ends with a useful 3-page summary.

The study is published by the Twentieth Century Fund, New York, of which the author was chief of research while he was writing the book, as well as professor of economics at New York University. Price for the two volumes is $10.00.

Process Instrumentation and Equipment

Contains photographs, operational data, and design feature descriptions of 12 varied products for positive control of materials in motion. Bulletin 100-R5. B-I-F Industries, Inc., 345 Harris Ave., Providence, R. I.

Precision Permanent Magnet Model 1048

Describes this model which features high stability in time and temperature. Also provides specifications and lists many applications. Data Sheet. Schlumberger Well Surveying Corp., Ridgefield, Conn.

Syntron Vibrating Joggers

Contains descriptions, data and specifications for five standard single-action joggers, three bin type and three double-action tilting rack joggers. Syntron Co., Lexington Ave., Homer City, Pa.

Stanley Steel Strapping System

Organized for quick reference this catalog provides illustrations and helpful tables which show seven ways to use steel strapping. Stanley Works, 111 Elm St., New Britain, Conn.

Uformite Resins for Wet Strength Paper

Discusses the chemical and physical properties of these resins, their stability, storage and handling requirements. Manual. Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa.

Star Pulp Pump and Asahi Paper Mill Washer

Describes a high density stock pump which will handle consistencies up to 13 per cent. Also discusses a portable high pressure water jet for washing down equipment in the mill. Asahi Iron Works Ltd., 1, 2-Chome, Nagarahama Dori, Oyodo-Ku, Osaka, Japan.

The Oliver Continuous Drum Filter

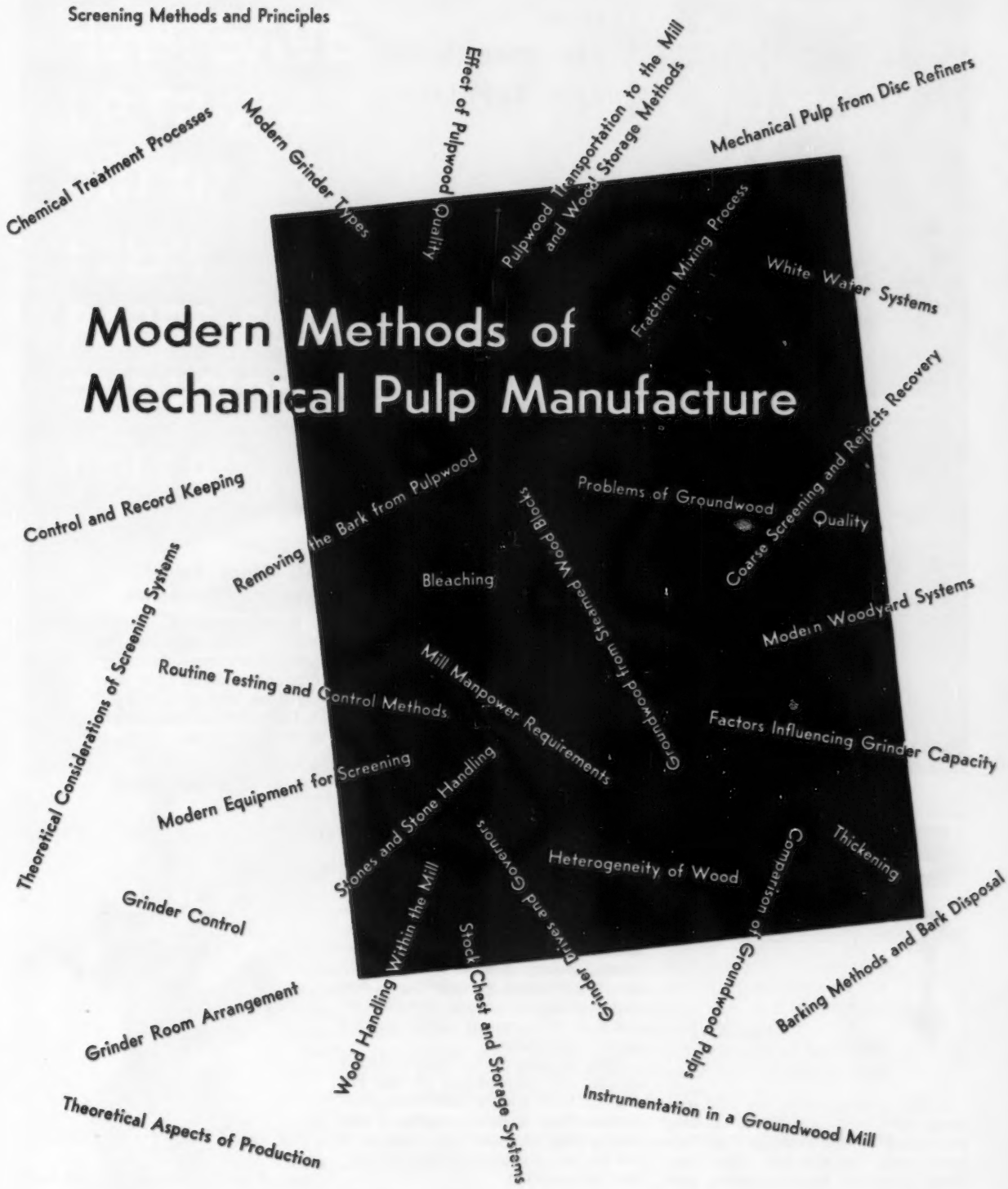
Tells about the designs of five principal types of rotary drum units and their component parts and details conventional accessories, auxiliaries, media and materials of construction. Bulletin 7200. Dorr-Oliver Inc., Stamford, Conn.

Tension Recording Controller

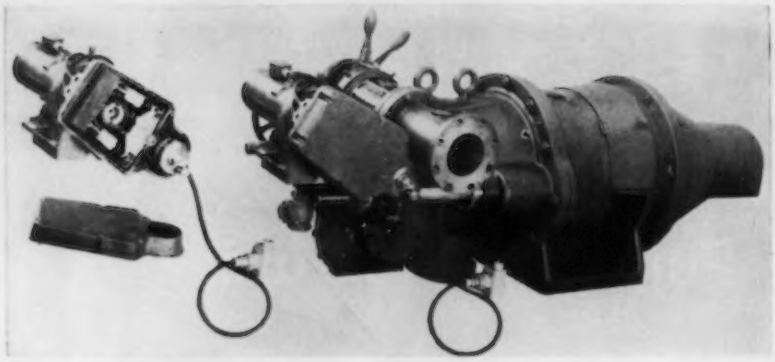
Describes their type HE potentiometric recorder and its combination with their tension head to measure, record and control tension of paper at various sections of a paper machine. Bulletin GET-2741-7. General Electric Co., One River Rd., Schenectady, N. Y.

The Taylortest I Instrument

Tells what it is and what it does. Also includes specifications and actual size photograph of the main panel. Brochure. Taylor Instrument Companies, Rochester 1, N. Y.


Screening Methods and Principles
Chemical Treatment Processes
Modern Grinder Types
Effect of Pulpwood Quality
Pulpwood Transportation to the Mill and Wood Storage Methods
Mechanical Pulp from Disc Refiners
Fraction Mixing Process
White Water Systems
Modern Methods of Mechanical Pulp Manufacture
Control and Record Keeping
Removing the Bark from Pulpwood
Problems of Groundwood
Coarse Screening and Rejects Recovery
Quality
Bleaching
Groundwood from Steamed Wood Blocks
Modern Woodyard Systems
Theoretical Considerations of Screening Systems
Routine Testing and Control Methods
Mill Manpower Requirements
Factors Influencing Grinder Capacity
Modern Equipment for Screening
Stones and Stone Handling
Heterogeneity of Wood
Thickening
Grinder Control
Wood Handling Within the Mill
Stock Chest and Storage Systems
Grinder Drives and Governors
Comparison of Groundwood Pulps
Barking Methods and Bark Disposal
Grinder Room Arrangement
Theoretical Aspects of Production
Instrumentation in a Groundwood Mill
Economic Importance, Main Properties, and Uses of Groundwood

. . . written by K. H. Klemm, this new book in 241 pages comprehensively covers all aspects of groundwood pulp production. Price: $5.00 from Lockwood Trade Journal Company, 49 West 45th Street, New York 36, New York

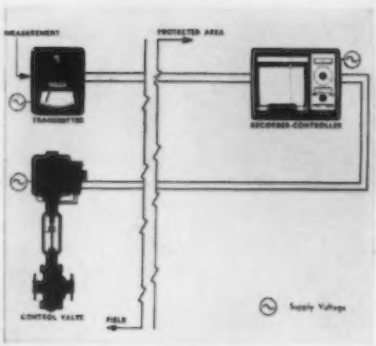


Remote Control Bar-Setting Device

Morden Machines Co., 3420 S. W. Macadam Ave., Portland, Ore., has developed the "Set-Maker" for push-button control of the bar setting on their "Stock-Maker" for refining, "Slush-Maker" for pulping and "Stuff-Maker" for jordaning.

As shown in the illustration, the "Set-Maker" is an electrical gear-motor drive working through a torque limiting device. The "Set-Maker" is attached to the handwheel shaft and has a built-in locking pin that can be disengaged for manual handwheel operation.

Tubeless Electronic Control



A full series of completely solid state electronic control instruments has been introduced by the Foxboro Co., Foxboro, Mass. The new line, called Electronic Consotrol Instrumentation, consists of advanced design transmitters, recorders, controllers, and valve operators, covering every function in the process control loop. Typical process measurements such as pressure, flow, and level, are converted at the transmitters to proportional current signals and instantaneously transmitted over unshielded lines to a control center. Converters for EMF and resistance measurements also feed signals to the small case, panel-mounted receivers. In the same electrical range are the controllers and final operators which complete the loop.

Features of the instrumentation, in addition to the use of magnetic amplifiers and transistors, are: choice of motion balance or force balance transmitters; electrical measurement converters, entirely tubeless and mounted for front-of-panel accessibility; a new control station design; and diversified installation arrangements using standard system components.

Other features of the instrumentation include: d.c. transmission so that unshielded leads can be used throughout with no effect from a.c. pickup; a current system unaffected by changes in line or load resistance induced by ambient temperature.

Announced in conjunction with the line is a new concept in control panel design—a modified semi-graphic approach in which the process diagram is displayed at top-of-panel and Electronic Consotrol Instrumentation arranged in standard panel cut-outs below.

New Nozzles Provide Fine, Hollow-Cone Mist

A new line of atomizing nozzles, made by Schutte and Koerting Co., Cornwells Heights, Pa., are designed for applications where liquids in quantities not over about 3 g.p.m. are to be sprayed as fine mists. These nozzles produce fine, uniformly atomized, hollow-cone sprays.

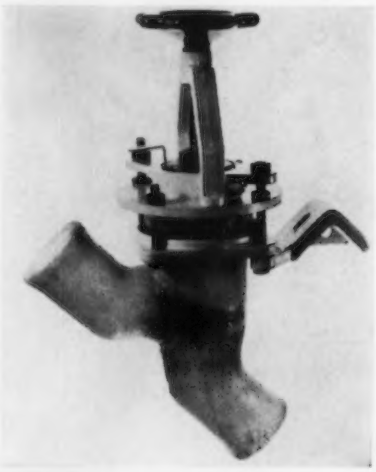
A half inch nozzle with 6.0 mm. orifice operating with water supplied at 60 p.s.i.g. has a spray angle of 80 degrees; the water capacity is almost 150 gallons per hour. With water supplied at, for instance, 130 p.s.i.g., this same nozzle will produce a fine, even spray and capacity increases to a rate of 220 gallons per hour.

A fine pitched spiral imparts a rotating motion to the liquid to make the hollow-cone spray. The nozzles are stocked in bronze and stainless steel and can be made of Everdur, Monel, and other corrosion-resistant materials on special order. A listing of the various nozzle types is contained in bulletin 6A-661, available from the manufacturer.

All Glass Valve Resists Corrosion

Both 2-inch and 1½-inch all glass Y-type valves which are virtually impervious to corrosion are now in production and available from stock at Corning Glass Works, Corning, N. Y.

The valves are made of Pyrex brand borosilicate glass. They are recommended for use in processing all acidic metallic salts, various crystalline slurries and all acids, except hydrofluoric and hot concentrated raw phosphoric acids. Temperatures as high as 250°F. can be handled by the valves. The valves are reported virtually impervious to corrosion.



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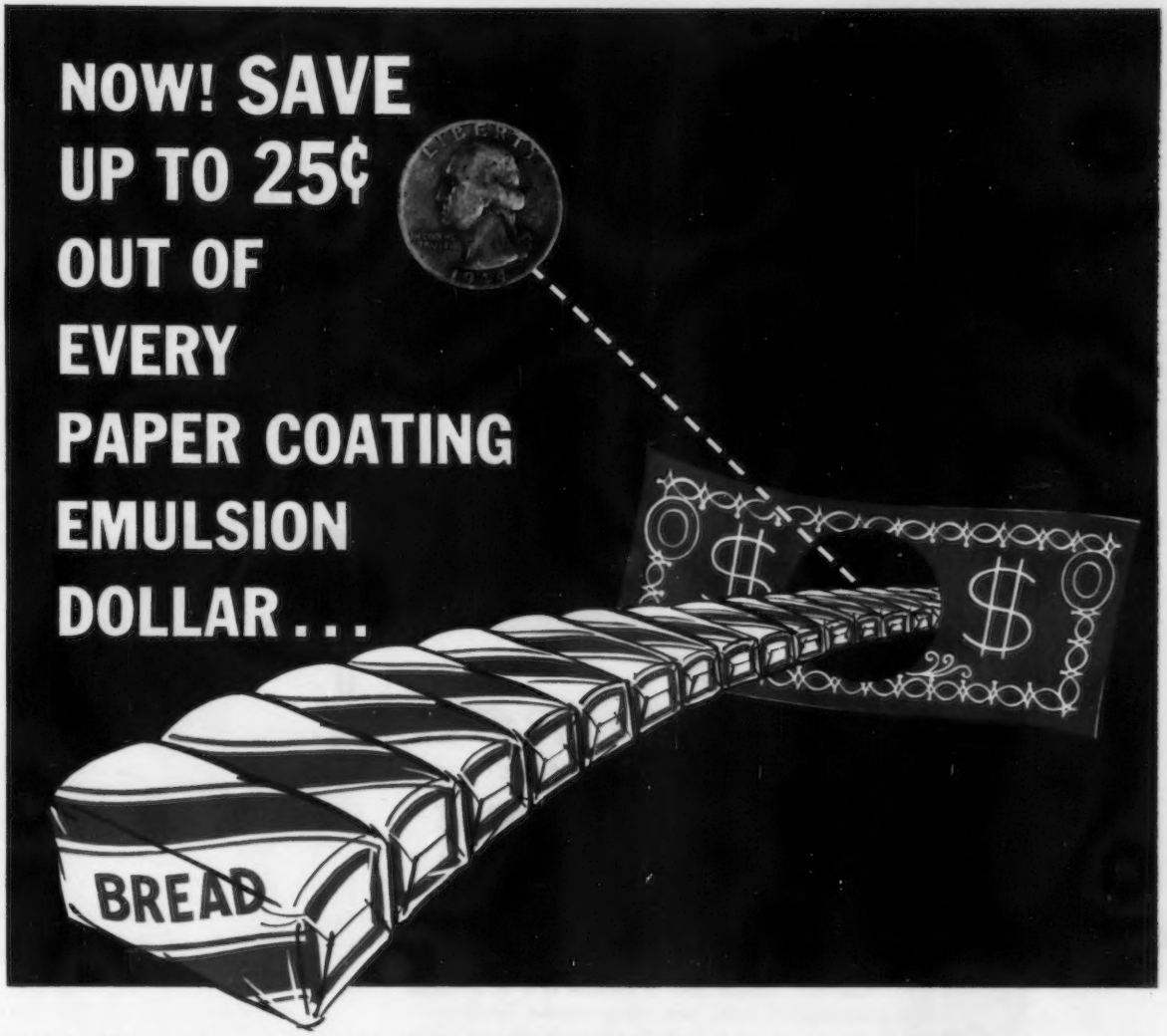

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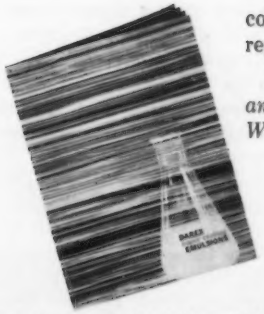
MICRO-PARTICLE PAPER COATING EMULSION

It's odor-free, grease-resistant, non-yellowing, highly flexible . . . *and up to twenty-five percent less expensive* than other low-odor polymers used for binding food wrap paper coatings. And that's only part of the good news about EVERFLEX MC-300 Micro-Particle Copolymer Emulsion.

Its fine particle size means better pigment binding power. It has higher color stability. Pick, crocking and water resistance are exceptional. And reproduction is excellent in either letterpress or offset printing.



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62 Whittemore Ave., Cambridge 40, Mass. • 100 W. Monroe St., Chicago 3, Ill. • 225 Allwood Rd., Box 361, Clifton, N. J. • *West Coast:* 2140 Davis St., San Leandro, Calif.

Corrosion-Resistant Graphite Pumps

Three new sizes of corrosion-resistant centrifugal pumps have been added to the line of Karbate impervious graphite pumps manufactured by National Carbon Co.

Known as models 22-FAL, 28-FAL, and 31-FAL, the new pumps are equipped with 1-, 1½-, and 2-h.p. 1750-r.p.m. motors. At this speed, the latter two types can deliver up to 150 gallons per minute. The two larger pump are available with 3- or 5-h.p. motors for handling fluids of higher specific gravity than water. Maximum total head for each of the new types is 33, 51, and 67 feet, respectively.

For further information on Karbate impervious graphite pumps, including performance curves and prices, write National Carbon Co., 30 E. 42nd St., New York, N. Y.

New Line of Jet Pump Motors

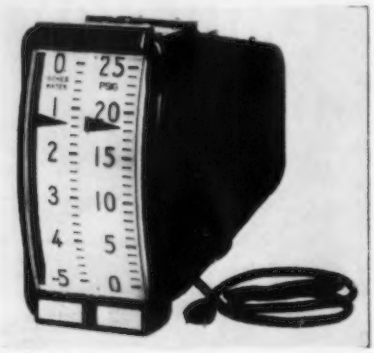
A new line of 48- and 56-frame jet pump motors designed especially for operation of water system centrifugal- or ejector-type pumps is now available from Westinghouse Electric Corp.

Termed "Jet-Line," the new motors have round frames with NEMA standardized 56C faces for direct mounting. They are equipped with grease-lubricated ball bearings designed for vertical or horizontal mounting.

Available in split-phase, capacitor-start and polyphase models, the units come with single or dual voltage, either 2850 or 3450 r.p.m. Dual-voltage motors have spade connectors for ease in changing voltage.

New Indicator Measures, Transmits

Pressure, draft, differential, and level are directly measured, indicated, and



transmitted by the new Bailey multi-pointer gage unit. This two-indicator unit is also furnished as a pneumatic receiver.

As a direct connected gage, each indicator section may contain a diaphragm element for draft, low pressure or differential measurement; a bellows element for intermediate pressure or level measurement; or a bourdon tube for high pressure measurement. Standard ranges from 0-0.5 inches water to 0-5000 p.s.i.g. are available.

As an indicating receiver each gage unit may contain two pneumatic receiving bellows. The gage unit then indicates any two variables capable of being transmitted pneumatically over standard SAMA signal ranges of 3-15 or 3-27 p.s.i.g.

As an indicating transmitter, one section of the unit is occupied by the measuring element while the second section contains a pneumatic or an electric transmitter.

Any number of gage units may be mounted adjacent on the same panel to provide multiple indications. The Multi-Pointer Gage Unit is manufactured by Bailey Meter Co., 1050 Ivanhoe Road, Cleveland, Ohio. Product Specification M42-2 is available on request.

Jam it-Free it!

turn of an air valve frees log jams

MURCO "V" TYPE CHIPPER SPOUT

WITH PNEUMATIC CYLINDER OPERATED COVER

NO SPOUT PLUGGING. Jam-ups eliminated by use of specially designed hinged cover on new MURCO V-Type Spout . . . hinged cover is operated by a double acting pneumatic cylinder with valve located convenient to chipper operator. Air operated cylinder lifts spout cover vertically approximately 2¾" to free jammed logs—saves time . . . eliminates accident hazards . . . safer to operate.

OPERATED FROM NORMAL AIR SUPPLY. Air cylinder operates at pressures from 50 to 100 lbs. per square inch.

Shown here is spout cover raised vertically approximately 2¾".

"V" TYPE SPOUT

V-TYPE SPOUT HOLDS WOOD FIRMLY. Holds any size stick firmly because of specially designed V-shape. Wood moves in a straight line with no side movement to disturb cutting. Sawdust reduced to a minimum; and chip quality improved.

HEAVY DUTY DESIGN FABRICATED STEEL . . . Bed knives arranged for easy removal. Spout bed knives are precisely positioned in relation to disc knives resulting in a shearing action, producing quality chips, yet eliminating splinters and sawdust.

CAN BE INSTALLED ON ANY MAKE OF PULPWOOD CHIPPER

Write today for complete details . . . specify make and size chipper on which MURCO V-Type Chipper Spout with pneumatic cylinder operated cover is to be used.

MURCO

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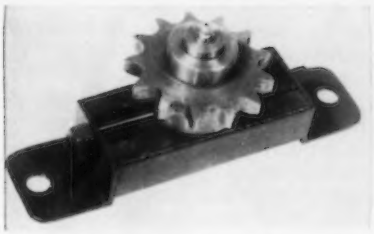
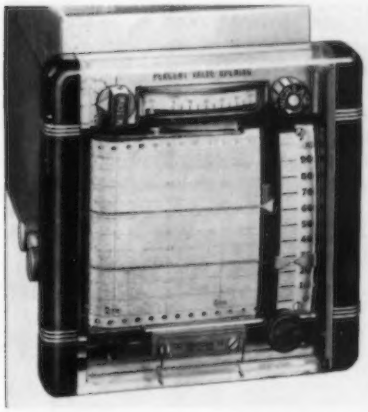


Campact, Unbreakable Chain Tightener

A device to smooth out roller chain drives and provide ample take-up for fixed-center and vertical chain drives is now available. Industrial Marketers, Box 28, Ferndale 20, Mich., are manufacturers and sales agents.

Incorporating a fixed shaft on a heavy lead-screw built into a welded steel frame, the chain tightener is compact, sturdy and unbreakable. A pressure lubrication fitting and safety set-collar are included. Two stock sizes are available.



2-Pen Electronic Recorder

A new, all-electronic two-pen recorder which records two variables on a single chart has been announced by the Swartwout Co., 18511 Euclid Ave., Cleveland, Ohio. Latest in Swarthwout's line of Autronic process control instruments, the recorder permits the user to make quick, "one-glance" checks of a pair of related variables, or to cut instrument costs and conserve panel space. As an optional feature, the two-pen recorder can be furnished with a control set point, or alarm contacts, or both, for one of the variables.

Instrument sensitivity is 0.1 per cent or better, and the instrument is accurate to ±½ per cent of full scale. The strip chart is driven by a dual sprocket and is easily rewound to examine past records without breaking chart continuity or tearing the chart.

Van-Cor

90 and H Joining Strips

Revolutionary Method of Connecting PVC Sheet Stock — Van-Cor 90 and H joining strips use solvent welding to obtain maximum joint efficiency. They save time and money compared with hot air welding. Skilled welders are unnecessary—your own men can fabricate readily. On major installations using these Van-Cor strips, job costs have been cut over 30%!

Two Shapes—Three Sizes—Use 90 degree joining strips for making corners, H strips in a single plane. They handle sheet in ⅛", 3/16" and ¼" gauges. Both shapes available in Van-Cor 1 (normal impact) and Van-Cor 2 (high impact). Standard strip length is 10 feet.

For flanges and stiffeners of fabricated sections, extruded structural angles in 10 foot lengths are available in sizes 1½" x 1½" x 3/16" and 2" x 2" x ¼".

Write for Complete Data

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Subsidiary of THE VAN DORN IRON WORKS CO.

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for the manufacture of Cellophane, Rayon and Products of Paper

Restigouche
BLEACHED SULPHITE PULP

FRASER COMPANIES, LTD.
Edmundston, N.B., Canada

Emergency Pipe Clamp

M. B. Skinner Co. of South Bend, Ind., has just introduced the Junior Emergency Pipe Clamp. The clamp is made up in single bolt width and is only 2⅞ inches wide.

Made of malleable iron, it has a full length hinge along one side, a single oversized plated bolt on the other. Installation is quick. Just place the narrow or top half of the clamp on the pipe opposite the leak. Then hook the gasketed half on the hinge. Press this wide gasketed half against the leak—and bolt will automatically fall into place. Tighten nut and the job is done.

Clamps are available for 2 inch pipe; 2½ and 3 inch sizes will follow in the near future.

Regulators Not Affected By P-F, Frequency or Load

Changes in load power factor supply power frequency or load do not affect the operation of General Electric's Inductrol voltage regulators.

For industrial applications requiring critical, drift-free voltage control, these units of dry-type construction are available in standard ratings up to 600 volts, 240 kva, single-phase, and 600 volts, 720 kva, three-phase. Special Inductrol regulators are available for higher voltages and circuit capacities.

Operating on the stepless induction principle, Inductrol regulators introduce no harmful wave-form distortion. They hold output voltage to within plus or minus one per cent bandwidth and will withstand 25 times normal short-circuit current and up to 100 per cent overload for one hour.

Ratings, weights, dimensions and application data are given in bulletin GEC-1450, General Electric Co., Schenectady 5, N. Y.

Compression Packings

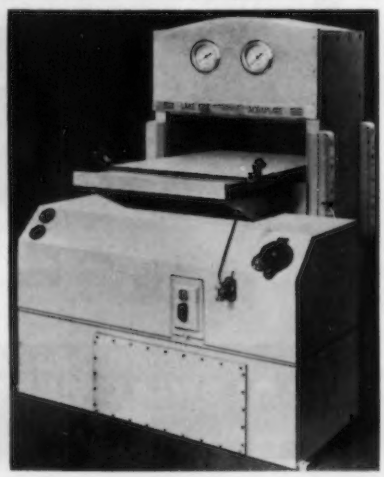
A new line of compression type packings is now being marketed by E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa. Trade-named Val-Pac, the new line includes both sheet and rod seal types common to industry.

Sheet packings are available on the roll or as pre-cut gaskets in natural rubber, several types of synthetic rubber, compressed rubber and asbestos, laminations and vegetable fiber or "paper" packing. Rod seals are being supplied in cotton, flax, jute, asbestos (domestic and the tougher Blue African), and metal. Constructions are twists, plaits, braids, wraps and laminations. The rod seals are impregnated with lubricants, and are supplied on spools, as cut rings, or as spirals and coils.

NEW EQUIPMENT FOR CONVERTERS

Hydraulic Presses for Laminating, Embossing or Bonding

Suited for laboratory work or specialized production, the press illustrated



is one of three standard sizes of self-contained hydraulic presses for laminating, embossing or bonding built by Lake Erie Machinery Corp., Buffalo, N. Y.

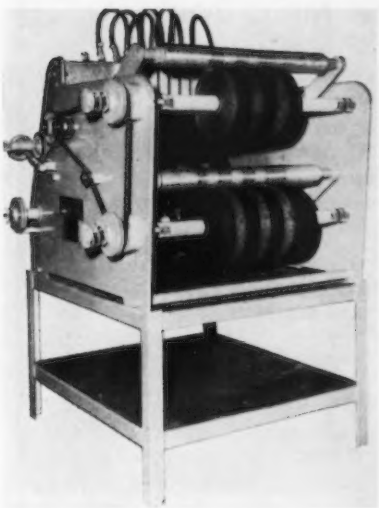
Heavy side plate construction and large rams underlying nearly the entire platen areas provide platen parallelism within three thousandths of an inch over the full area. A hardened and ground rolling work plate facilitates otherwise difficult work loading.

Presses are offered in seven tonnage capacities from 180 to 400 tons and platens from 24 by 20 inches to 36 by 28 inches. All models are provided with accurately calibrated pressure controls and can be equipped with either hand lever or automatic pushbutton operating controls. Time cycle controls are also available as are a pressing speed control and heated platens.

Hot Melt Applicator Feeds Cord-Like Adhesive

A new type of hot melt adhesive applicator designed to feed, melt and apply cord-like adhesives is available from United Shoe Machinery Corp. Designated Thermogrip Applicator, Model CW, the device complete with electrical heat controls can be incorporated easily into machines where a gluing operation is required. It uses a transfer wheel method of applying the molten adhesive to individual passing package surfaces or other objects. The wheel can be designed to apply a variety of patterns. Typical applications include package ends, tabs, or sides, tipons and other non package operations where automatic glue assembly is desired. The unit functions equally well on its side or upside down, a unique feature that makes Thermogrip readily adaptable to a variety of uses and convenient gluing positions in existing equipment. During operation the unit automatically feeds and melts from a reel of 3/16 inch diameter adhesive.

New Slitter Incorporates Spinning Reel Principle



A duplex rewind slitter, featuring slip clutches operating on a spinning reel principle to minimize tension, has been introduced by the Doven Division of Appleton Machine Co. The model (BD-S-24) is available with either score cut or razor blade slitting stations.

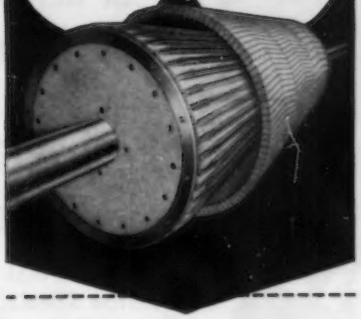
Tearing of material, caused by excessive tension created by the pull of the rewind shaft, has long been a headache to converters of paper, textiles, tissues, carbon paper and synthetics. The new score cut or razor blade slitter eliminates this problem with a pair of felt driven overriding slip clutches located on the rewind shaft.

Material is fed through the machine by a pair of nip rolls whose pressure is controlled manually; therefore, the duplex rewind shafts have only to take up the slit material with enough tension to insure a uniform roll. In addition, the rewind shaft on Doven's new duplex rewind slitter is designed with a patented core principle permitting each rewind roll to operate independently from the others. This self-adjusting feature compensates for caliper variation influence.

The slitter is available with either a 4-speed or a variable speed drive to handle parent rolls up to 24 inches maximum width in diameters to 15 inches. Speeds range to 750 feet per minute.

IDEAL COMBINATION FOR ANY

Conical Refiner



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The completely bandless plug for *all* Jordans, the Jones Adapta-Plug is also the strongest, most adaptable, most economical plug ever made.

This revolutionary advance, exclusive with Jones, not only holds bars more securely, reduces slot wear and corrosion, but also cuts hours from the job of stripping and filling.

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Fulbar Shell Fillings eliminate keys and wedges. One piece construction fits shell body of any Jordan, simplifies handling, cuts installation time. And the patented No-wave pattern — also exclusive with Jones — has no sharp bar-ends to form strings or lumps.

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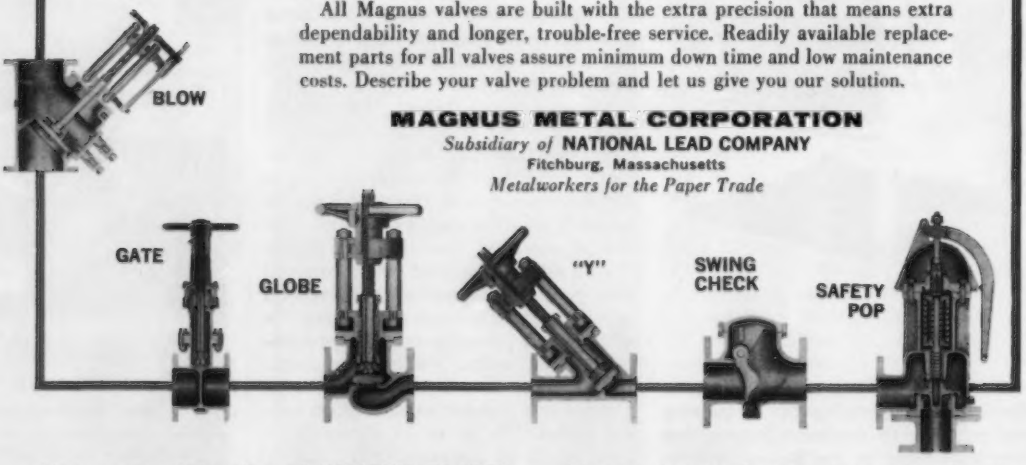

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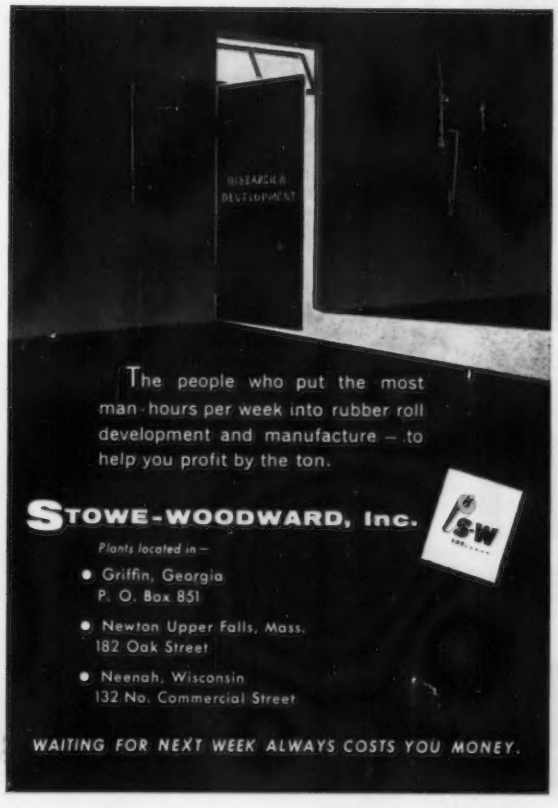

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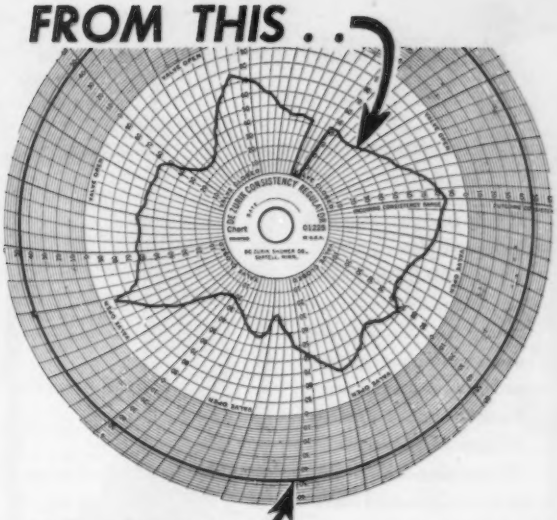

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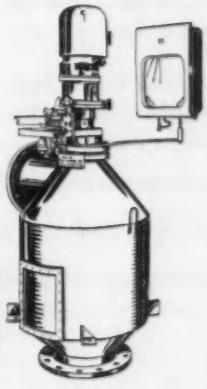

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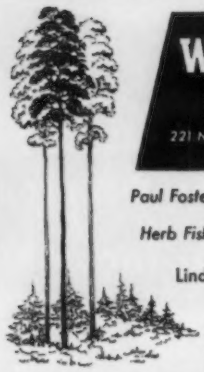

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Address: Research Director, West Virginia Pulp and Paper Company, Research and Development Laboratory, Covington, Virginia.

S-22

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Must be experienced in PotDevin bag machines.

Excellent opportunity for advancement right man in Pacific Coast mill.

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Good opportunity for experienced salesman of chemical auxillary products in the paper field. To cover southern states. Send complete details of experience and education to Box 58-227 care of Paper Trade Journal.

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1—128" B & S 10-Roll Calender Stack. King Roll 24" Dia. Heavy box frames, full set of doctors. Excellent Condition.
1—86" Farrel 8-Roll Calender Stack. Anti-friction Bearings. Excellent Condition.
26—36" x 72" Complete Dryer Section, Stack, Drives, Etc.
10—48" x 150" Pusey & Jones Dryers.
1—84" Kamyr Machine, Complete. 75 ton per day output.
1—E. D. Jones Majestic Jordon No. A-482. New S.S. Fillings. Like New.
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3—No. 3 Impco Rotary Knotter Screens. S.S. Plates.
1—110" Pusey & Jones 2-Drum Winder. A.F. Bearings.
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1—42" Dia. x 110" Face Pope Type Reel. Excellent Condition.
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1—54" Dia. x 48" Face Valley Iron Tub Beater.
1—Dilts 53" Dia. x 60" Face—2000 lb. Iron Tub Beater. S.S. Extractor Type Hood.
1—Seybold Knife Grinder. Size G, 84" Table. Serial #4X802.
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2—#2 Bird Screens with Copper Vats & S.S. Plates.
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1—100 H.P. U.S. 3/60/220-440 Volt, 900 RPM, D.P. Motor.
1—A.C. 75 H.P. 3/60/220-440 Volt, 720 RPM. T.E.F.C. Type ARZX Motor.
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1—G.E. 100 H.P. MG Set, 250 Volt D.C.
1—250 H.P. Ingersoll Rand Diesel Engine Generator Set—G.E. Generator, 150 KW, 480 Volts, 720 RPM.

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One is 82" x 54 ft. 10" wire Fourdrinier with three presses. First section of dryers 18—48" x 76", double deck, top and bottom felt equipment. Size press. Second section of dryers consists of 6—48" x 76", top and bottom felt equipment. 2 calenders, reel, winder, drive, prime mover, pumps, as last operated, including L 7 Nash, No. 5 Bird Saveall, DeZurik consistency regulator, 4 Vortraps, Jones Imperial Jordan, 3A Bird screen. Machine last producing about 16 to 18 tons of 20 to 60 lb. Bond.

Second machine is Fourdrinier with wire 65" x 32 ft. 11" wire. Has 14" suction couch, 3 presses, 30 dryers 28 x 72" with top and bottom felt equipment in First Section. Size press. In Second Dryer Section there is 24" lead dryer and 6 dryers 36" x 72" with top and bottom felt equipment. 5 roll calender. Reel. Moore & White cutter with layboy. Drive including prime mover. Two L 6 Nash pumps. Pony Jordan. Last producing about 6 to 10 tons sixty to eighty lb. Bond.

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Degree not necessary—only the ability and practical background for independent design of converting machinery.

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ONE CARTHAGE 38" x 5' HYDRAULIC WOOD SPLITTER. COMPLETE WITH PUSH BUTTON CONTROLS. PURCHASED NEW IN 1957 AND IN EXCELLENT CONDITION. CAN BE INSPECTED.

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Screens, either late type Shartle or late type Bird, suitable for seven to ten ton each per 24 hours. Could also use Bird Vibrator Screens or Shartle Selectifier Screens for smaller tonnages. Box 58-238 care Paper Trade Journal. S-29

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21—Bronze 6″ primaries & 2″ secondaries.

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1— 82″ Lobdell 5 roll.
1— 86″ Lobdell 5 roll.
1—115″ B-C 7 roll
1—124″ B-C 5 roll
1—124″ B-C 6 roll
1—128″ Downingtown 7 roll

CYLINDER MOLDS
2— 63″ face x 36″ dia w/rubber couches
1— 72″ face x 48″ dia
1— 73″ face x 48″ dia
1— 92″ face x 30″ dia
1—102″ face x 36″ dia
2—104″ face x 36″ dia
1—107″ face x 48″ dia; A-F Brng
2—111″ face x 36″ dia; A-F Brng
1—132″ face x 36″ dia; A-F Brng
1—132″ face x 42″ dia; A-F Brng
1—136″ face x 54″ dia; SS covering

CYLINDER WET ENDS
1— 99″ face x 48″ dia Downingtown single cylinder; 18″ dia couch
1—132″ face x 36″ dia Beloit seven cylinder; 18″ dia couches & four sets of presses

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Various 2 hp thru 150 hp Reeves, PIV, etc.; open & enclosed; parallel & rt angle; horizontal & verticle

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16″ Dia.: 2—46″ face w/Accessories.
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24″ Dia.: 39—46″ face; Chrome plated.
28″ Dia.:
3—70″ face w/gears & bearings
3—73″ face w/gears & bearings.
3—74″ face w/gears & bearings.
3—77″ face
2—84″ face.
2—160″ face w/rope carriers.
36″ Dia.:
1—42″ face.
2—44″ face.
2—46″ face.
8—70″ face w/gears & bearings.
13—72″ face w/gears & bearings.
1—74″ face; Lukenweld w/A-F Brng.
3—74″ face w/gears & bearings.
4—75″ face w/gears & bearings.
12—76″ face w/gears & bearings.
1—77″ face w/gears & bearings.
1—78″ face w/gears & bearings.
20—78″ face; complete section.
2—80″ face.
6—84″ face.
1—92″ face.
1—104″ face.
1—138″ face.
10—160″ face.
42″ Dia.:
1—110″ face.
1—120″ face.
1—160″ face.
48″ Dia.:
58—46″ face; chrome plated.
1—52″ face w/gears & bearings.
1—82″ face w/gears & bearings.
5—90″ face w/gears & bearings.
10—100″ face w/bearings.
1—128″ face.
1—130″ face.
14—160″ face.

EMBOSSERS
1—80″ Hudson Sharp; A-F Brng

EXTRACTOR ROLL
1—134″ face x 24″ dia Downingtown w/18″ dia rubber couch

FILTERS—STEEL VATS
1— 6′ face x 3′ dia Dorr-Oliver
1—10′ face x 8′ dia Dorr-Oliver continuous
3—14′ face x 8′ dia Oliver Kraft Stock Washers

FLAT SCREENS
1—10 Plate IMPCO w/dunbar drive & bronze vat
7—12 Plate Beloit w/witham fasteners
2—12 Plate IMPCO w/braemer controls

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1—Appleton #2 w/A-F Brng & SS filling
1—Smith & Winchester w/granite filling
1—Jones #4 Imperial w/A-F Brng & SS filling

MOTORS—3 PH. 60 CYCLE
1—100 hp GE; 440 v; 695 rpm
3—100 hp GE; 440 v; 435 rpm
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1—150 hp West; 440 v; 1780 rpm
1—300 hp West; 440 v; 388 rpm
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PUMPS
Various open & inclosed impellor centrifugal

REELS
1— 86″ Downingtown two bowl
1— 94″ Downingtown two bowl; 60″ dia rolls
1—100″ Kohler automatic two arm unwind reel; 60″ dia rolls; new condition
1—150″ B & S pope type w/Reliance drive

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2—#1 Claflin; A-F Brng
1—#1 Dilts Hydrafiner w/motor & S.S. filling
1—24″ Downingtown Weiner; new
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ROLLS—PRESS, COUCH, CALENDER, ETC.
Various rolls of all types and sizes

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1—Farrel-Birmingham for rolls up to 160″ x 30″
1—Farrel-Birmingham for rolls up to 240″ x 32″ w/crowning device

ROTARY SCREENS—BIRD
12—#3A, Model 100 w/SS or copper vats

SHEETERS—DOUBLE KNIFE
1—64″ Dillon
1—80″ B-C heavy duty board model
1—87″ Hamblet w/backstand & layboy
1—157″ Masson-Scott; like new

SHEETERS—SINGLE KNIFE
1—49″ Hamblet
2—53″ Hamblet
1— 54″ Hamblet w/layboy & backstand
1— 60″ Hamblet w/backstand
1—60″ Hamblet w/layboy & backstand
1— 64″ Hamblet w/overlapping layboy & backstand
1—65″ Hamblet
1—65″ Hamblet w/backstand
1— 65″ Kidder Spot Sheeter w/elec. eye
1— 70″ Hamblet w/layboy
1—71″ Hamblet
1—80″ Hamblet w/layboy & backstand; A-F Brng.
1—82″ Hamblet w/layboy & backstand
1—100″ Hamblet w/backstand
1—100″ Hamblet w/3 pile layboy
1—110″ Hamblet
1—124″ Cameron quick change slitter assembly

SLITTERS & WINDERS
3— 12″ Schultz Types AS & LDX
1— 30″ Cameron Model 6 w/motor; 24″ dia re.
1— 40″ Fales Model B; 18″ dia rewind
2— 42″ Essex duplex; 30″ dia rewind
3— 42″ Cameron Model 6; 24″ dia rewind
1— 42″ Cameron Model 40-1A; 22″ dia rewind
2—48″ Langston duplex; 24″ dia rewind
1—50″ Cameron Model 6; 24″ dia rewind
1— 52″ Cameron Model 24-2A; 18″ dia rewind
1— 60″ Hudson-Sharp; plastic coated paper
1— 60″ Langston; shear cut; 30″ dia rewind
1— 60″ Kidder Model SH; 40″ dia rewind
3— 62″ Cameron Model 6; 24″ dia rewind
2— 62″ Cameron Model 9-5; 30″ dia rewind
1—62″ Cameron Model 8; heavy duty
1—62″ Cameron Model 6; 30″ dia rewind
1—62″ Cameron Model 6; 36″ dia rewind
1— 62″ Cameron Model 6; new 1951; 24″ dia re.
1— 64″ Cameron Model 8; 36″ dia rewind
1—70″ Center Winder w/variable speed motor.
1— 72″ Cameron Model 26-3A duplex.
1— 72″ Beloit shear cut; 40″ dia rewind
1— 72″ Hudson-Sharp high speed automatic
1—82″ Cameron Model 10-11A; A-F Brng; water cooled brake; 40″ dia rewind
1— 84″ Langston shear cut; 50″ dia rewind
1—110″ Cameron Model 18; 60″ dia rewind
1—124″ Cameron quick change slitter assembly
1—148″ Langston shear cut; A-F Brng; 60″ dia rewind
1—194″ Cameron Model 19; A-F Brng

STEAM TURBINE—PAPER MACHINE DRIVE
1—100 hp DeLaval w/reducer

SUCTION COUCH ROLLS
1—116″ drilled face x 18″ dia Sandusky
1—122″ drilled face x 18″ dia Sandusky
1—122″ drilled face x 25″ dia Sandusky
1—135″ drilled face x 22″ dia Sandusky
1—192″ drilled face x 30″ dia Millspaugh

SUCTION PRESS ROLLS
1— 90″ drilled face x 18″ dia Sandusky
1— 98″ drilled face x 18″ dia Sandusky
1—166″ drilled face x 19″ dia Millspaugh; used 2 mos; A.-F. Brng; rubber covered.
1—194″ drilled face x 30″ dia Millspaugh

SUPERCALENDERS
1—63″ Norwood 7 roll; A-F Brng.
1—65″ Norwood 7 roll; A-F Brng.
1—92″ Norwood 7 roll w/drive

THICKENERS
1— 92″ face x 36″ dia cyl w/rubber couch; less vat
6—132″ face x 36″ dia cyl w/16″ dia rubber couches; A-F Brng
1—132″ face x 42″ dia cyl w/16″ dia rubber couch; A-F Brng

TRIMMERS—POWER BACK GAUGES
1—56″ Seybold Dayton
1—56″ Seybold Precision w/auto. spacer
1—74″ Seybold 20th Century
1—84″ Seybold 12Z
1—84″ Seybold Dayton w/motor
1—94″ Seybold Precision w/motor & air table

UNWIND STANDS
1—68″ Cameron Constant Tension
1—68″ Johnstone Constant Tension

VACUUM PUMPS
2—H-4 Nash w/10 hp motors
1—L-4 Nash
1—L-5 Nash
1—H-8 Nash
1—#3 Nash w/25 hp motor
4—#2, #3 & #6 Nash Hytors
1—7 x 10 Connersville

VOITH INLETS
2— 86″ Valley Iron Works
1—144″ B & S high speed w/headbox; SS clad
1—156″ New Valley w/36″ headbox; monel lined

YANKEE DRYERS
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1—140″ face x 12′ dia Beloit; 75 psi

WAXERS & COATERS
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8—48" x 148" Pusey & Jones
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4—42" x 140" Beloit
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1—48 x 89"
26—36 x 88" Black & Clawson, with frames, gears, bearings
4—42 x 86" Black & Clawson
104—Moore & White, double deck, 36 x 84" with frames, gears, bearings
15—36" x 82" Downingtown with frames, gears, bearings
1—48 x 78"
12—36 x 76"
4—40 x 76"
4—42 x 73"
4—36 x 64"
2—48 x 56"
2—49 x 48"
40—48 x 46"
16—36 x 44"
9—36 x 40" with frames, gears, bearings

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Number 1 Emerson, anti friction, 3/16" bronze filling
Number 1 Emerson, plain bearing, ring type filling
Number 4 Emerson Junior, anti friction, ½" bars
Noble & Wood Unifiner or Mammoth Junior, anti friction, new 1951
Horne Pony Jordan, new Bar type filling, 100 HP 440 volt motor
Jolly Pony Jordan, stainless steel filling
Noble & Wood Mammoth D
No. 2 Appleton
Jones Majestic
36—2 Sprout Waldron refiner, 325 HP motor

FOURDRINIERS

228" Pusey & Jones, 80 ft. wire.
210" Pusey & Jones, 89 ft. 9" wire, removable. Pressure head box. Stainless steel rails, cross ties. Most of parts new 1953.
200" Beloit, wire 65 ft. 6½", removable. 30" Beloit couch.
2—170" Rice Barton, 30" couch, rebuilt 1951.
145" Rice Barton, oscillator for boxes. Stretch and guide, new 1950. New shell for 22" couch, never used.
96" x 64 ft. 10" Valley slice, 25" Downingtown suction couch.

PAPER MACHINES

120" Fourdrinier, 2 suction presses, 21—48" dryers, calender, reel, winder. Set up as last operated. Trim 112"
102" Yankee with 10 ft. dia. dryer, new 1952, ASME tested 160 lbs. Fourdrinier, suction press, calender, reel, Jordan, Selectifier screen
102" x 28 ft. wire Fourdrinier tissue machine, trim 101". Speed 365 FPM. Production about 4 tons per day toilet tissue facial grade. 6 ft. Yankee dryer, calender, winder, L 8 Nash vacuum pump.
2—102" Fourdrinier machines, trim 88", three plain presses, 48" dryers, 2 calenders, reel, type 18 Cameron winder.
Four cylinder 81" trim board machine, moulds 36 x 93", 32—36" x 87" dryers, 2 calenders, reel, winder, duplex cutter, drives, Jordans, screens.
Six cylinder 80" trim machine, moulds 48" x 96", two primary presses, anti friction. 3 main presses, anti friction. 38 dryers 48" x 86", triple deck. 2 calenders, Duplex cutter, 2 drum winder, drive, pumps.
72" trim Fourdrinier machine with wire 82" x 54 ft. 10". 18" suction couch. 3 plain presses. Second press reverse. 18 dryers 48 x 76", double deck with top and bottom felt. Size press. 6 dryers 48" x 76". Top and bottom felt equipment. 2 calenders, reel, winder, drives, prime mover, pumps, as last operated including four Vortraps, Jones Imperial Jordan, 3A Bird screen, Number 5 Bird Saveall, L 7 Nash pump, last producing about 16 to 18 tons of 20-60 lb. Bond. Machine can be inspected while operating.
72" trim Yankee Fourdrinier machine, speed 350-400 FPM, production four tons per 24 hours, 24 x 36, 10 lb./480 tissue. Fourdrinier Rice Barton, 5 ft. dryer, drum reel, Cameron slitter and winder, hoist, pumps, midget Jordan.
65" x 32 ft. 11" Fourdrinier paper machine, last producing 6 to 10 tons 80 lb. Bond, including Pony Jordan, suction couch. 3 presses, second press reverse. 1st dryer section 30 dryers 28" diameter, top and bottom felt equipment. Size press. 2nd dryer section 24" lead dryer, 6—36" x 62" dryers, top and bottom felt equipment. 5 roll calender, reel, Moore & White cutter, prime mover, Pony Jordan, 2 L-6 Nash pumps and other equipment as last operated. Machine can be inspected while operating.

WINDERS

30" Model B Fales slitter, new 1947.
42" Cameron, type 6
48" Kidder, Merchants Model, shear cut, new 1948
2—52" type 26 3-A Cameron duplex
48" Langston sheet type heavy duty slitter and winder
2—52" type 9 Camerons, water cooled unwind, spring operated tension roll, ten sets slitters, rebuilt
Langston 60" shear cut slitter
82" Langston Style B, drums 7½" x 82", rewind 36"
84" Pusey & Jones two drum, five sets shear cut slitters. Take roll 84", rewind 42" diameter.
98" face Pusey & Jones two drum.
108" type 18 Cameron, rewind 60", anti friction bearings, roll ejector, 40 HP 440 volt wound rotor motor
116" Warren winder with slitter attachment
Beloit two drum winder, drums 15" x 128", anti friction bearing, shear cut, individual drum type drive.
132" Dominion, new 1947, rewind 40". 50 HP wound rotor motor.
146" Langston type DA, anti friction bearings, rewind 40"
154" Rice Barton two drum shear cut, drums 16"
158" Moore & White four drum, 15" dia. drums, rewind 40", shear cut slitter
160" type 18 Cameron, rewind 42". Air operated slitters. Water cooled unwind, constant tension unit.
186" type 19 Cameron
220" type 20 Cameron

TRIMMERS

84" Seybold precision, new knife
84" 20th Century, 10 Hp motor, rebuilt
1—64" 20th Century
2—64" Seybold Dayton
60" Sheridan
52" Lawson, new 1952

SHEET CUTTERS

140" Hamblet duplex Model 29, anti friction bearings, with backstand, new 1937
140" Hamblet single
108" Moore & White cutter and layboy, rebuilt
90" Hamblet duplex with layboy and 10 roll backstand
88" Hamblet
88" Moore & White with layboy
76" Moore & White
64" Moore & White
56" Moore & White with layboy
32" Hamblet with four roll backstand, lay off table

CALENDERS

5 roll 144" box frame, water cooled bearings
2—126" 7 roll, box frame, water cooled bearings
1—106" 9 roll Lobdell, water cooled bearings, box frame
2—9 roll Sandy Hill 106", spare set of rolls, spare bearings
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6 roll 72"

SUPERCALENDERS

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1—9 Roll 66"
1—8 Roll 40"

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2—3A Bird, totally non ferrous, bronze plates cut .016", 440 volt motor.
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2—2A Bird, copper vat, 100" plates
2—2A Bird, 70", bronze plates, cut .016", totally non ferrous
1—3A Bird, 70"

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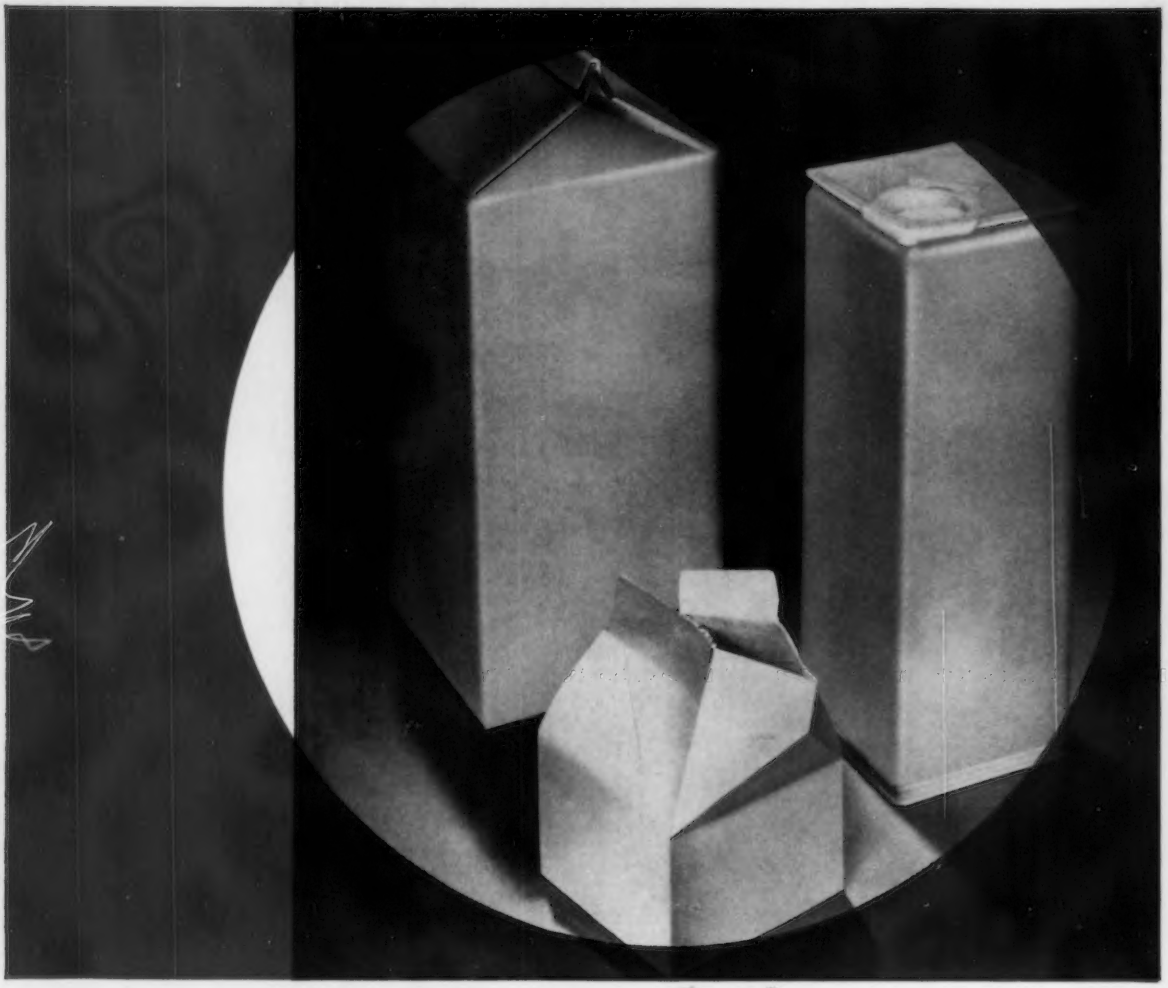
To produce quality pulp for quality papers, Weyerhaeuser stresses rigid control throughout the mill.

For instance, at our Everett Kraft Pulp Mill, 131 readings, tests and reports are made on process variables every hour.

And before it is baled and shipped, the finished pulp is subjected to ten major control studies. No effort is spared to make Weyerhaeuser pulp a consistently pure and uniform product that paper-makers can and do rely on.

WEYERHAEUSER

PULP DIVISION



CMC ON SOLID FIBERBOARD FOR BETTER WAX HOLDOUT

CMC applied at the size press or calendar provides higher and more uniform densometer for better wax holdout. Densometer can be controlled to meet desired customer specification. Result: More uniform waxing, lower wax consumption, less mottle, less pin-holing.

CMC for the production of improved solid fiberboard is readily available from Hercules' strategically located facilities. For technical service, or for additional information on Hercules® CMC and its applications in the paperboard industry, write:

HERCULES cmc

Virginia Cellulose Department

HERCULES POWDER COMPANY

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900 Market Street, Wilmington 99, Delaware

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